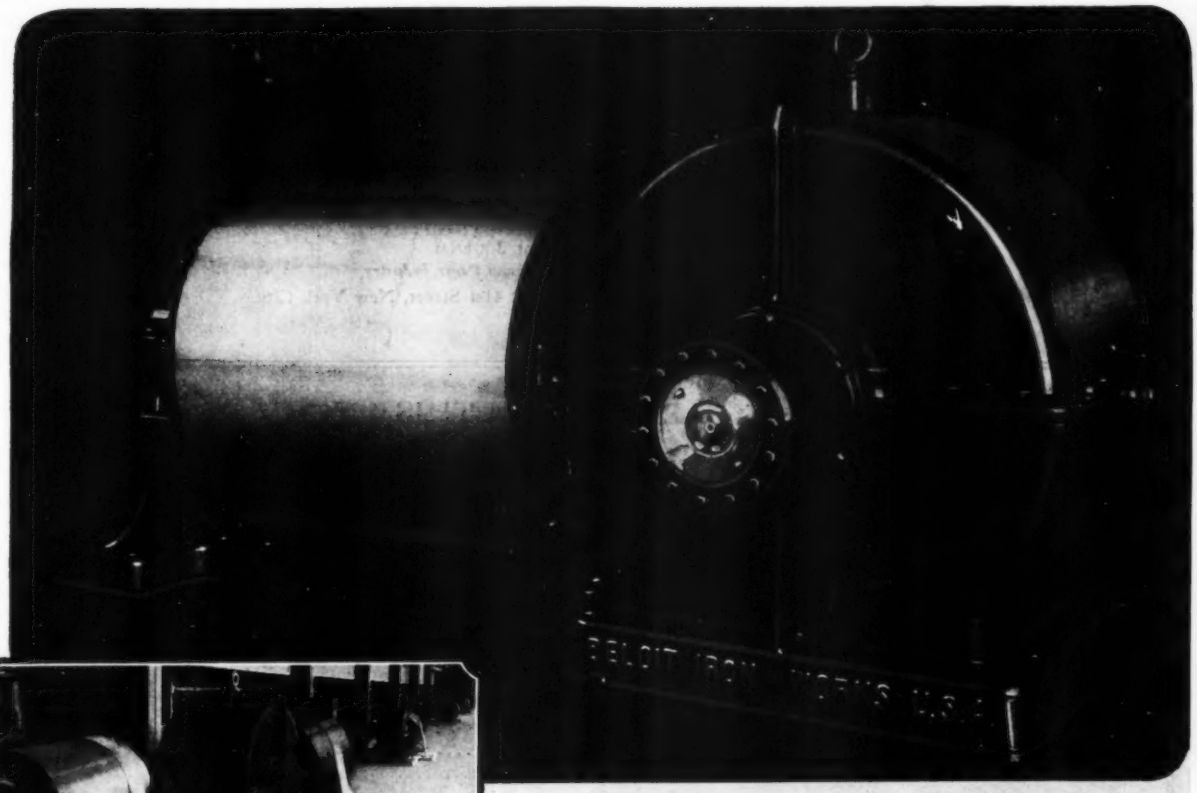

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A Smooth, Simple Drive for Changing Speeds, Weights and Draws

THERE is a demand on the part of the papermaker today for a simple drive, adapted to high speeds, where he changes speeds and weights, which in turn changes his draws and helps him to prevent weakening his paper by undue stretch.

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The *Beloit* Way is the *Modern* Way

BELOIT IRON WORKS, BELOIT, WIS., U. S. A.

The BELOIT

Vol. 11—No. 12
MARCH, 1930

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry
THOMAS J. KEENAN, Associate Editor, 18 East 41st Street, New York City

MEMBER AUDIT BUREAU OF CIRCULATIONS

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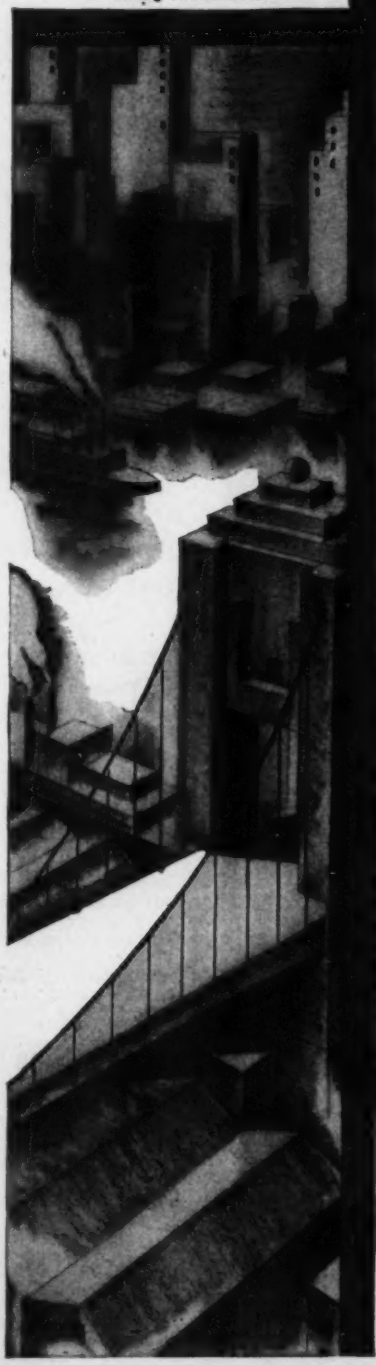

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Easy and accurate control of moving parts.
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The C-E Multiple Retort Stoker is the result of extensive research and development work—the sole objective of which was to build a multiple retort stoker distinctly better than any existing stoker of this type—capable of superior performance. This stoker is built in two types—the Super-Station for large boiler units and the Standard type for medium-size units.

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his company offers eight types of mechanical stokers whose satisfactory performance can be verified at hundreds of installations, under practically every combination of fuel, load demand and application arrangement.

Other stokers manufactured by Combustion Engineering Corporation:

Green Forced Draft Stoker	Type E Stoker
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200 Madison Ave. **New York, N. Y.**

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8 " "	3.66	12 " "	3.75
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"Specializing in Pulp Control"

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Here's A Pipe That Can Be Used Anywhere

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Maximum Structural Strength — Mo-lyb-den-um — With Minimum Weight

ADDED VALUES.
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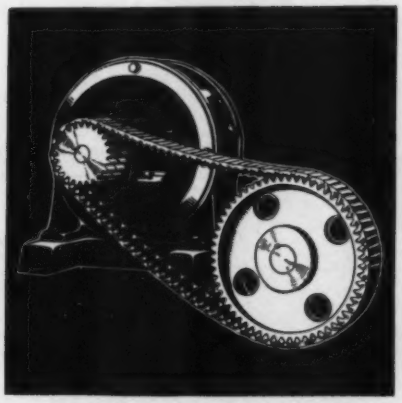

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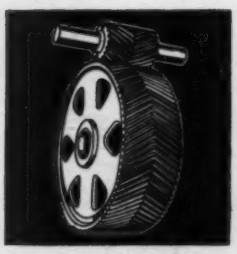

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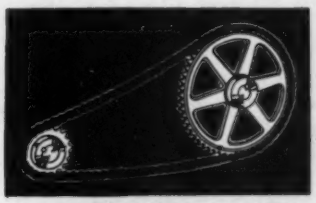

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Leading manufacturers of positive power transmitting equipment

3886

The Paper Industry

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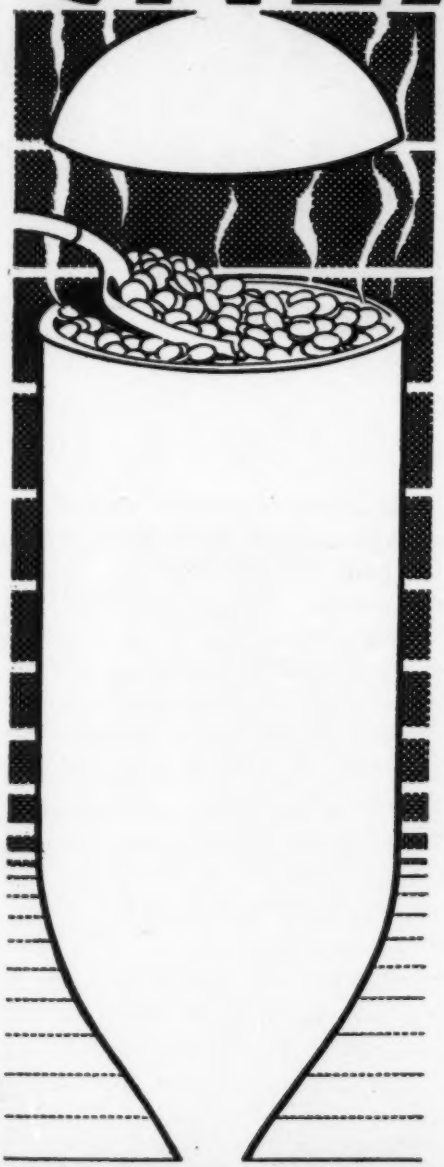

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BUT IT'S BEING DONE . . . unwittingly . . . daily . . . in sulphite mills everywhere . . . quite possibly in YOUR mill.

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capitalizes these wastes... turns them into profit...

It has reduced sulphur consumption over 12%

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It has saved one mill $170 a day

These are results actually achieved and substantiated by reports in our files. Similar results can be attained in many sulphite systems. INVESTIGATE! We'll give you all the information you want.

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* THE CHEMIPULP PROCESS—a revolutionary process for the recovery of hot SO_2 gas and liquor from sulphite digesters and its efficient re-utilization through the digesting system *under high initial temperature and pressure.*

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80 H. P. Morse Silent Chain Drives from motors to beaters

MORSE Silent Chain Drives are used with remarkable results in almost every line of industry, under wide and varied conditions in the United States and abroad. In numerous instances they have been responsible for faster production, better workmanship, and lower operating costs. Machines driven with these remarkable power transmission units give smooth uninterrupted service, with a friction loss of 1.4%.

Morse Silent Chain Drives maintain a positive drive on the driven shaft with remarkable quietness even at high speeds. They are flexible, easy to install and maintain, are compact, and conserve valuable floor space.

There is a Morse Power Transmission engineer located near you who will gladly work with you towards cutting your power transmission costs. Call him in. Send for the new Morse Power Transmission Data File. Mail the coupon below today—there is no obligation.

MORSE CHAIN CO., ITHACA, N. Y.

Manufacturers of Morse Silent Chain Drives, Flexible Couplings, and Chain Speed Reducers

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E. D. Jones

& Sons Co.

Pittsfield
Mass.

74 Years

of

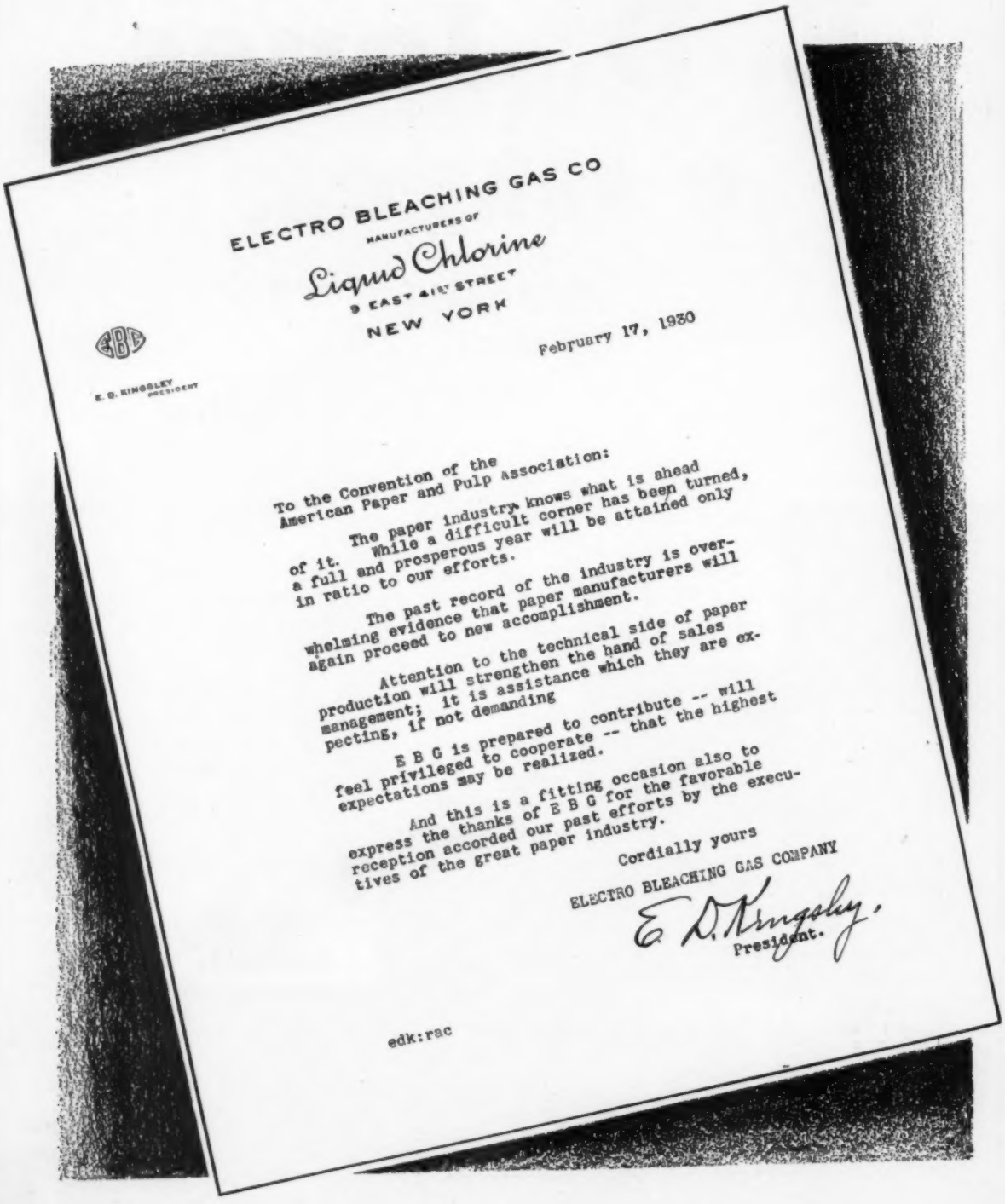
Experience

Progress

Reliability

and

Satisfaction



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MANUFACTURERS OF

Liquid Chlorine

9 EAST 41ST STREET

NEW YORK

E. D. KINGSLEY
PRESIDENT

February 17, 1930

To the Convention of the
American Paper and Pulp Association:

The paper industry knows what is ahead of it. While a difficult corner has been turned, a full and prosperous year will be attained only in ratio to our efforts.

The past record of the industry is overwhelming evidence that paper manufacturers will again proceed to new accomplishment.

Attention to the technical side of paper production will strengthen the hand of sales management; it is assistance which they are expecting, if not demanding

E B G is prepared to contribute -- will feel privileged to cooperate -- that the highest expectations may be realized.

And this is a fitting occasion also to express the thanks of E B G for the favorable reception accorded our past efforts by the executives of the great paper industry.

Cordially yours

ELECTRO BLEACHING GAS COMPANY

E. D. Kingsley.

President.

edk:rac

The Business "Slow-Down"

A COMBINATION of adverse conditions is slowing general business down.

The "slow-down" of business is seen in the reluctance of manufacturers and producers in almost every line of industry to proceed with their usual production schedules. The reason for this reluctance is found in the fact that overproduction of commodities has at last come to its natural climax.

The potential capacity of the country to produce commodities is limitless, but the potential capacity of the country to consume commodities has reached and passed the saturation point for the time being.

Therefore, production must halt and give the consumption an opportunity to catch up. In other words, the demand for commodities has declined while the supply has increased. An adjustment of supply to the demand is only natural and inevitable.

If this were all there were to the business problem, the time required for the remedial action would be comparatively short, the readjustment could be accomplished forthwith and a resumption of business activity would not be far away.

But complications and disturbing situations has crept into the equation which will take time to solve.

One of these is the willful, ignorant persistence with which certain large factors in various industries have continued to build new mills and factories and to bring in new equipment for additional burdensome overproduction, long after the statistics in those industries have indubitably shown that the augmenting supply of those commodities presaged profitless operations for the offenders and negligible returns to all other producers in the same line of endeavor.

In some divisions of industry, the forecast figures for potential production show an excess of 40 per cent over supply, above the most optimistic consumption demands during the current year. On top of this, the big producers in that particular industry insist upon forcing their 100 per cent production upon a stagnant, rebellious market and to cap the climax are found to be considering the building of more producing units.

And all of this in face of annual statements which show continued operating deficits mounting higher as each year rolls by.

These are hard problems to solve. When reason, common sense and ordinary business judgment is deliberately ignored in the management of big producing and merchandizing corporations, what appeal can be made to correct so palpable and devastating production blunders?

That remedy remains for such gross managerial stupidity is most certain. The operation of the economic law will check such operations in time.

But the time required to bring about the change is time wasted by industry.

Time is money—and wasted time is wasted money.

A demoralized time-wasting division of the industry is a distinct economic check to the progress of general business and a detriment to the prosperity of the country.

Overproduction is a stupid mental blunder

E D I T O R I A L

chargeable to incapable, incompetent management.

Unwarranted price-cutting, which inevitably follows in the wake of a willful overproduction program, is the outstanding proof that incompetent managements exist.

The "slow-down" in general business must of necessity persist until production management reforms.

An early return of prosperous business conditions is dependent upon the early reform in production managements.

Regional Shifts in the Paper Industry

IN a very significant address delivered by former president D. Clark Everest before the annual meeting of the American Paper and Pulp Association in New York last month, which is abstracted briefly in the report of the proceedings appearing elsewhere in this issue of THE PAPER INDUSTRY, attention was called by him to some of the great regional shifts in production of papers of various kinds, caused either by movements of population or economic conditions. Mr. Everest's observations on these regional developments, which are now attracting particular attention in the southern and Pacific Coast states, should be read in connection with the studies of regional pulpwood costs of the Woodlands Section of the American Paper and Pulp Association to which reference has been made previously in these columns. A good argument for more extensive forestry on the part of paper manufacturers in the eastern parts of the United States is contained in these studies.

The situation as regards newsprint and exports of pulpwood from Canada is a difficult one to discuss. One thing that stands out prominently is that paper production in Canada has shown a considerable increase during the past year. What Mr. Everest terms "a wild rush of regional development" has taken place in Canada. "Through desire on the part of the Dominion Government to exploit its resources and build up the country, together with the urge of an increased demand for newsprint, there has been brought about an overproduced condition in Canada which cannot be absorbed by a normal increased use under five or six years, if no more mills are built or machines added," and it is pointed out that this has been true of every regional shift ever made.

The new regional shift of production on the Pacific Coast has been favored by cheap transportation. While Canadian wood still has the advantage in low transportation costs in other regions of the United States, the Pacific Coast has advantages of extensive timber resources for the manufacture of pulp and lower waterway rates through the Panama Canal for its product. This is a development which is likely to exert a profound influence on the economic position of all grades of paper, and has moved Mr. Everest to declare that the industry has never been faced with such a complex condition as exists today. What the country needs is a breathing spell, a moratorium in development, with an intelligent regulation of productive activity during the period.

To revert once more to the regional studies undertaken by the Woodlands Section of the American Paper and Pulp Association, it has been demonstrated that there are in the United States to-day wide variations in pulpwood costs, consequent on geographic location and conditions of wood supply, or of inherent pulping qualities of the timber, geographical location being of most importance, because low wood costs of certain regions might be offset by higher transportation costs for paper products, even when in competition with high initial wood cost in regions nearer the markets.

While it would be a serious handicap to United States mills in the eastern part of the country if economic conditions in the Dominion should make it necessary to impose a tax on pulpwood leaving Canada, this would ultimately be adjusted by new regional shifts, starting first with coarse papers and extending gradually throughout the whole industry as the technic of adapting processes to new woods is developed.

Pooling Knowledge

NOT many years ago, if one paper manufacturer tried to visit the mill of another manufacturer he was looked upon with suspicion and rarely invited to go out to the mill. This condition has changed to a considerable degree in the past few years, and yet there are still some manufacturers who do not appreciate visits from their competitors.

Associations like the American Paper & Pulp Association, the Technical Association, the Superintendents Association and others of like kind have all been formed with the one idea in mind of

Under the guidance of an organization devoted specifically to this one field

BLEACHING TAKES ANOTHER STEP FORWARD

* * *

Nine years ago the founders of this organization introduced the first significant improvement in half a century—a practical system of

HIGH CONSISTENCE BLEACHING

which has become the accepted standard.

Remarkable further gains in both quality and economy are now obtainable thru our recent development of

TWO PHASE BLEACHING

There is more to this story than just dividing the bleaching cycle into two steps. We should like to tell you about it.

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Pulp Bleaching Corporation

200 Fifth Avenue New York City, N. Y.

E D I T O R I A L

disseminating knowledge to the members of these organizations. At the recent meetings in New York there were possibly many more than a thousand people gathered mainly with the idea of gaining some knowledge that would be helpful to them in their work. Many men went to these meetings with the idea of giving out valuable ideas that they had discovered during the past year, with the hope that what they had to say would be beneficial to other people in the same line of work. Yet there are many manufacturers, technical men, superintendents, and others who will listen to what these other men have to say and try to profit thereby, and at the same time are thoroughly opposed to giving out anything themselves.

This is a mistaken idea, as we believe that the man who keeps aloof from his fellow-man for fear that he will be compelled to give something out, is never in shape to assimilate much when he has the opportunity to share the ideas of others.

There have recently been formed a number of associations. Some of them are composed of non-competing manufacturers, while others are composed of manufacturers who do compete with one another. The main aim of such an association is to improve management, insure growth, increase profit. Members contribute to the common pool from their strength and knowledge. They draw out of the common pool such knowledge as they require, and the aim for all is the highest achievement in any line reached by any one member of the group.

It is well known that magicians who discover certain new methods of cure do not keep this information to themselves, but give it out to the world for the betterment of mankind. This is true of scientists who work for years on some problem and as soon as it is solved this information is given out so that other men can derive benefit from it.

We believe that the time is coming when industry will scorn to keep for its own uses, results obtained through research which would increase the store of knowledge of the whole industry or of all mankind. We, as an industry, or a nation, have plenty with which to do, but we have hardly learned as yet what to do with it.

Co-operation in study and research among non-competitors is a good start, but co-operation in research among competitors for the benefit of all will, with the proper leadership, do much for the paper and pulp industry as well as for any other industry.

If a machinery manufacturer discovers some new type of device to do work better than that of any other machine ever used, he immediately makes it known and his competitors easily know what he is doing. We believe that any of the associations in this industry would advocate that each of its members agrees to hand out every valuable idea or method it has developed to fellow members. If this were done—if these ideas were pooled and given out to the whole industry—it would be possible to make tremendous savings over what is being done at the present time.

We know that the argument is presented that it does not pay to tell one competitor what you are doing as he would have the same advantage as the one who discovers new methods of procedure, but this is not always true, as the man who discovers some new ideas would be able to give these out to the world, and by the time his competitor could utilize them—if at all, as no two mills can be run exactly alike—the other man's thought will have advanced away beyond any information which he has given out. It is one thing to blaze the way and another thing to follow. The man who blazes the way is always in advance of the crowd.

Lumber and Its Substitutes

FOR many years foresters have predicted a curtailment in the use of lumber, and data given out by the New York State College of Forestry at Syracuse University seem to bear out the fulfillment of that prophesy.

While the lumber industry has been hurrying westward to cut the last supply of virgin timber, and while it has been engaged in an effort to keep production at its peak, persistent falling off in per capita consumption is noted as well as in the total amount of lumber produced. The curious thing about the reduction in timber output is the fact that lumber is still overproduced and that the market is frequently flooded with more lumber than can be absorbed. This explains away the fact that lumber is not being used as much as formerly because of the scarcity of timber. The constantly growing remoteness of timber supplies and the increased cost in production, due largely to the scarcity of the right kind of forests in the right location, have resulted in placing prices upon timber that are not comparable with prices of wood substitutes.

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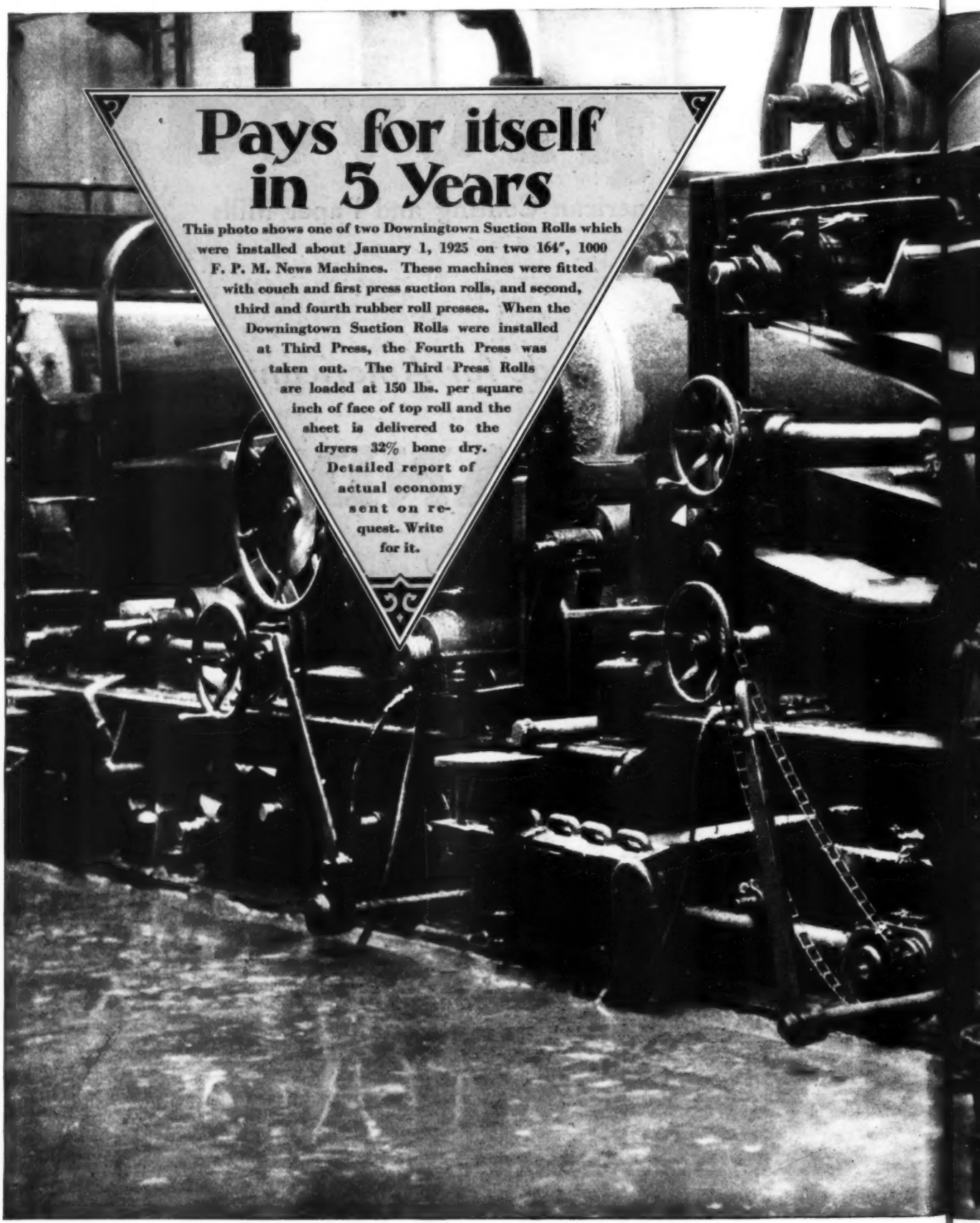
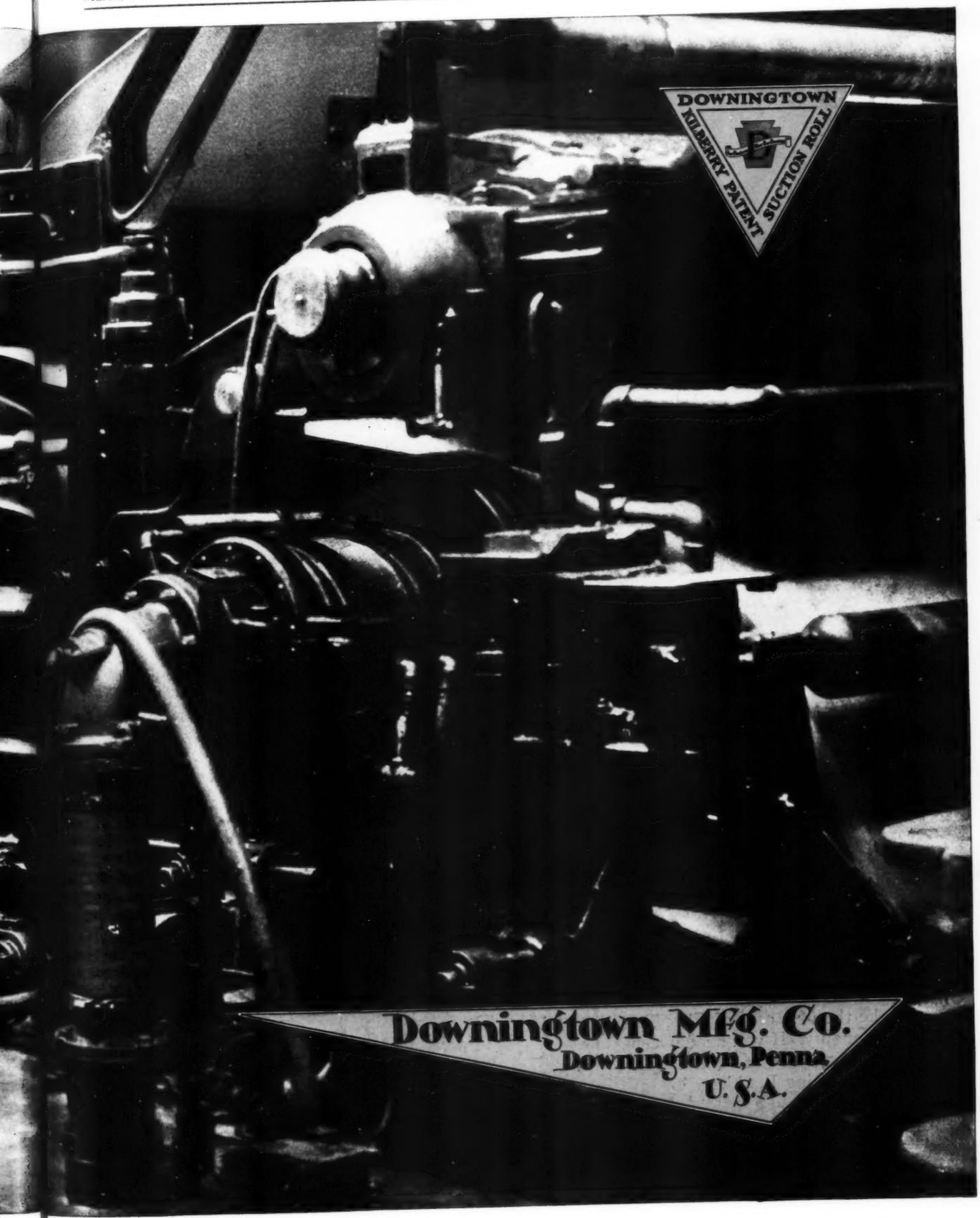

Pays for itself
in 5 Years
This photo shows one of two Downingtown Suction Rolls which were installed about January 1, 1925 on two 164", 1000 F. P. M. News Machines. These machines were fitted with couch and first press suction rolls, and second, third and fourth rubber roll presses. When the Downingtown Suction Rolls were installed at Third Press, the Fourth Press was taken out. The Third Press Rolls are loaded at 150 lbs. per square inch of face of top roll and the sheet is delivered to the dryers 32% bone dry. Detailed report of actual economy sent on request. Write for it.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For the Beater Drive in a Paper Mill

A drive that calls for maximum resistance to acids and heat on the part of the belting—the place to use Flex Tan.

Made with water proof cement—impervious to moisture; guaranteed to stretch no more than oak tanned leather and with tensile strength equal to the best leather belting. Flex Tan Belts are the constant choice of the paper mills and other industries where unusual working conditions prevail.

Maximum durability, efficient service make the first cost of Flex Tan a real economy. If you need exceptional Belting service send for the Flex Tan Belting Booklet.

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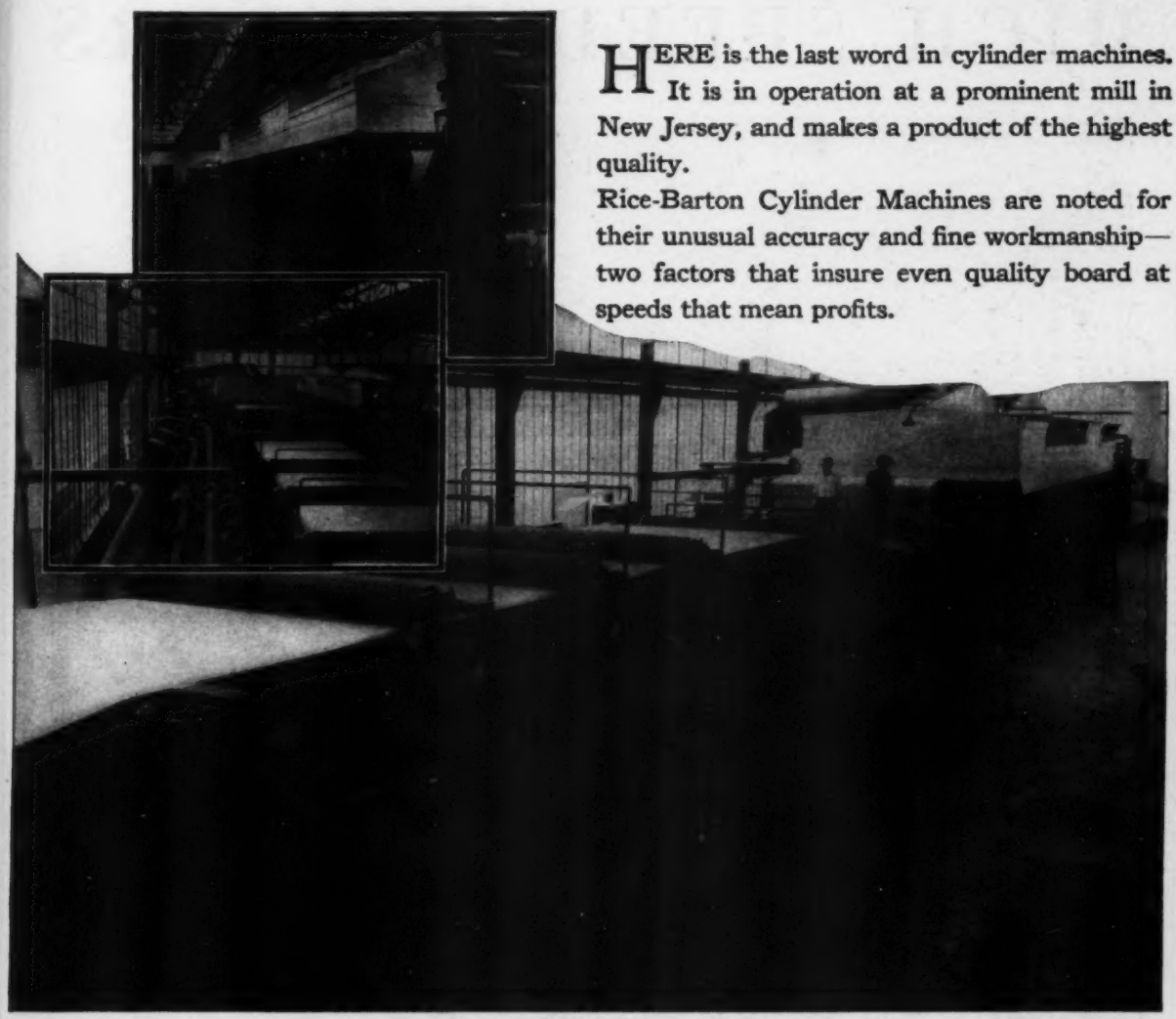
A New Rice-Barton 124-inch Cylinder Machine



HERE is the last word in cylinder machines. It is in operation at a prominent mill in New Jersey, and makes a product of the highest quality.

Rice-Barton Cylinder Machines are noted for their unusual accuracy and fine workmanship—two factors that insure even quality board at speeds that mean profits.

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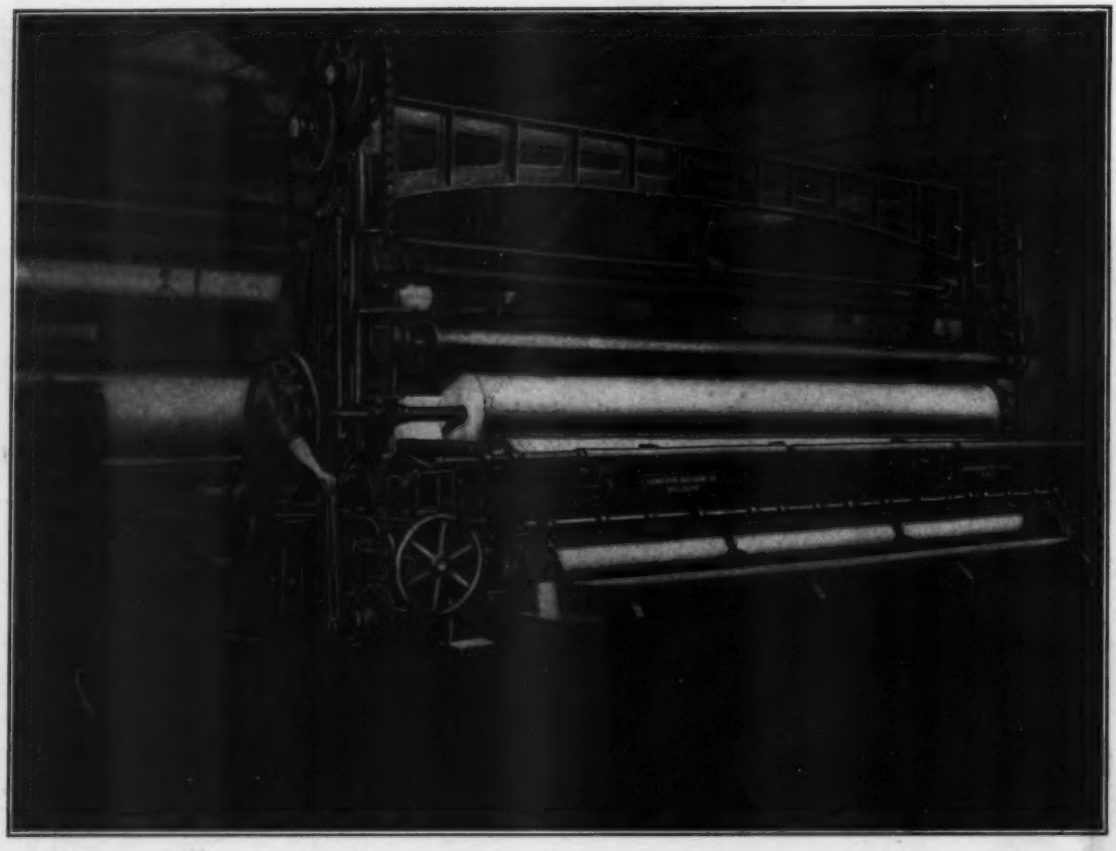
Incorporated
WORCESTER, MASSACHUSETTS
Paper Making Machinery Since 1837

EXPERIENCE

Engineering skill that is backed by the accumulated experience of nearly 100 years—complete manufacturing facilities—a determination to provide the best—a reputation for prompt and efficient service—these are some of the reasons why your next machine, new or rebuilt, should be a Rice-Barton.

HIGH SPEED WINDERS



. . . . sold on merit

Merit-demonstration is the basis of all sales of Camachine Slitters and Roll-Winders.

As designers, patentees and sole manufacturers of machines using the Camachine principle of slitting and roll-winding, the company is definitely sure of the superior service qualities of any machine it recommends for a specified purpose, and it is ready to install the machine in the prospective purchaser's plant anywhere in the United States or Canada, subject to his right to retain or return it after operating the machine during thirty days following its installation.

This merit-demonstration safeguards the customer by enabling him to assure himself definitely of the service he can depend on before committing himself to an actual purchase of the machine.

Merit-demonstration also permits the mill staff to satisfy themselves in a practical and risk-free way that Cameron built winders are good roll-winders and that they are preferable to others by reason of better roll production with more economical operation before they recommend or agree to the acceptance of the machine. We are satisfied to rest our case on merit-demonstration.

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STRENGTH

BORNE by the powerful mechanism of Chisholm-Moore systems, comes new strength, tireless and titanic, to Industry.

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In present-day production too frequently do we find some old and limping method struggling futilely to keep pace with swift machines. It is then that the handling of materials becomes a "bottle-neck", retarding the whole manufacturing process. Costly!

A Chisholm-Moore material handling installation, scientifically adapted to its specific duty, accomplishes this vital task with efficiency and dispatch. And in so doing effects astonishing economies in time and labor. Production cost is often halved!

Let a C-M engineer look over your plant. If modernizing changes in handling equipment are needed, he will make sane and valuable recommendations . . . The Chisholm-Moore line includes chain and electric hoists, traveling cranes, cupola chargers —sturdy installations for *every* handling job. Send for Bulletin 503.

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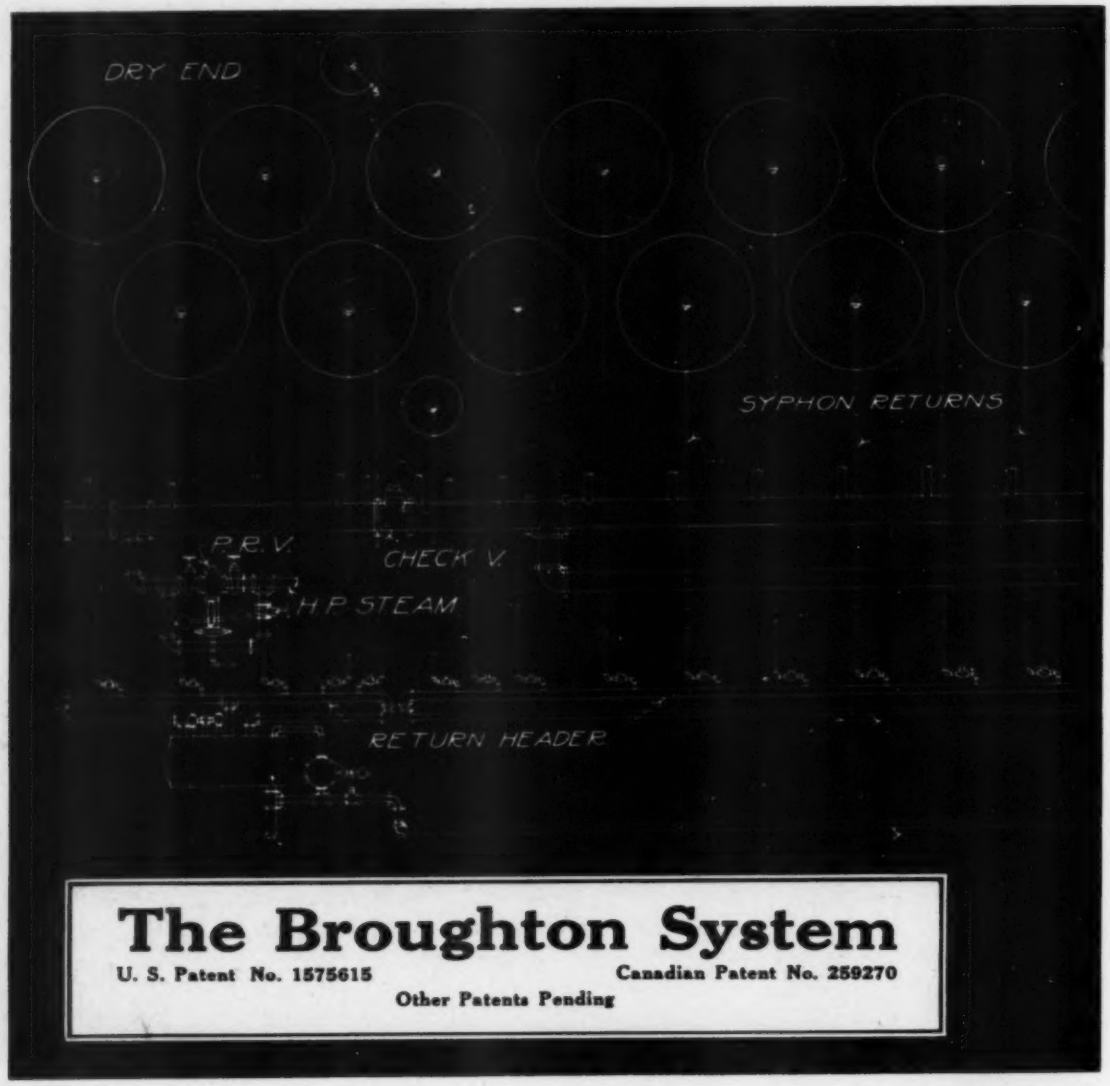


The Broughton System

U. S. Patent No. 1575615 Canadian Patent No. 259270

Other Patents Pending

The Most Natural Drainage System

The Broughton Drainage System is different from any known scheme or system in existence. It replaces all forms of re-circulation, individual traps and vacuum pumps, ejectors, orifices, and mechanical dippers. It allows natural laws to function without mechanical aid.

Complete Evacuation of Water

Condensation, occurring in the dryers, shuts off the steam flowing into the syphons and return header. Radiation immediately drops the pressure in these lines, and draws the water up and over the syphon bend, and into the return header where it flows by gravity to the Broughton condensation pump and metering unit. The swing checks in the syphons allow each dryer to have its own individual pull. The return header pressure is always equivalent to that of the dryers, assuring a condensate temperature to the power house exactly equal to the steam pressure. The Broughton condensation pump and metering unit will deliver this water to any point desired and at any temperature without the aid of any cooling medium. It will operate at any allowed pressure and meter with an accuracy of 99%. The water line governors permit nothing but water to flow into the receiver of the pumping unit. This receiver is equalized to the lowest pressure feeding into it.

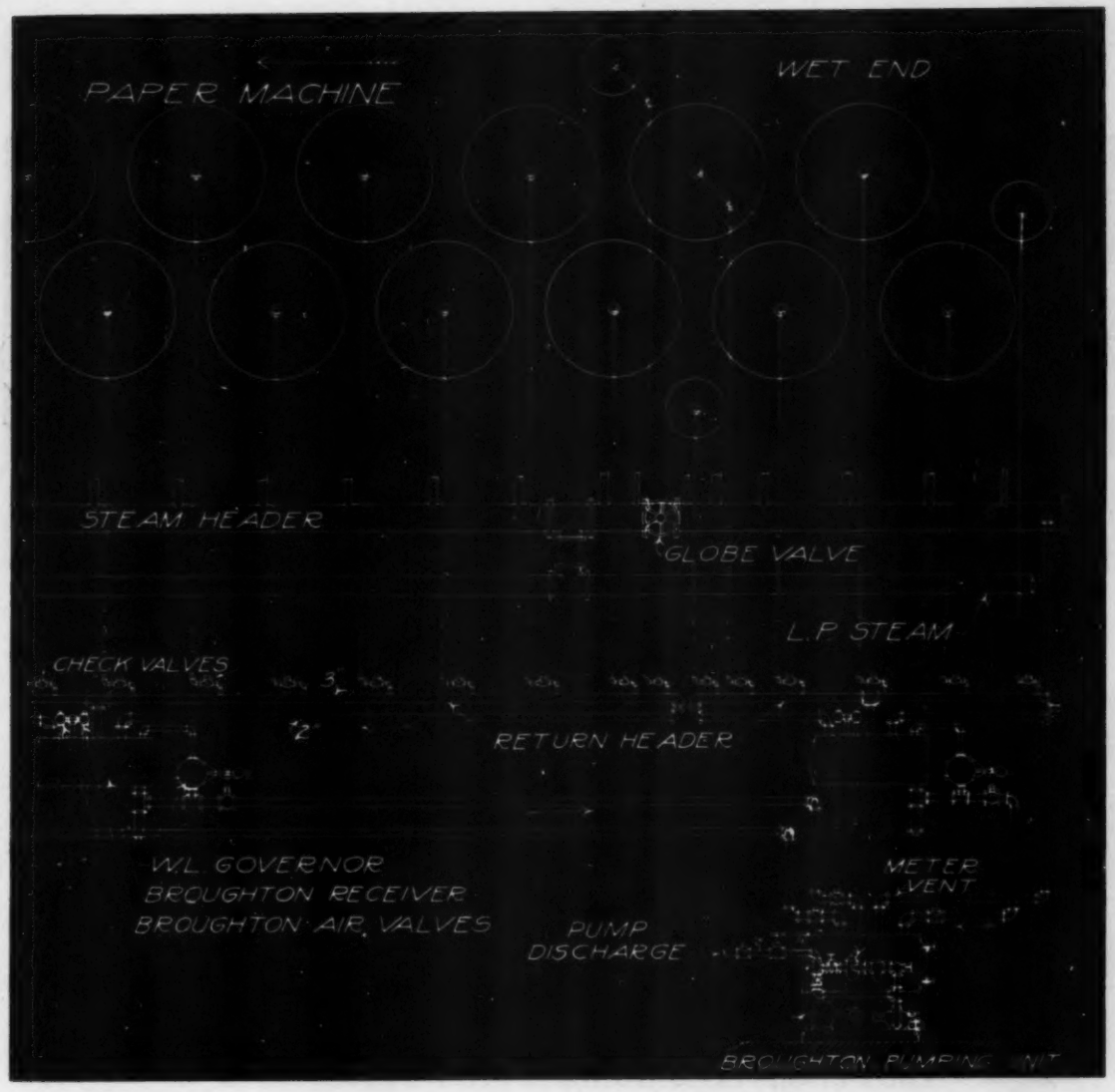
Elimination of Air

Air is nearly twice as heavy as steam, and whenever present in dryers, it lies at the bottom. Each little slug of water drawn into the syphons by the radiation pull, is followed by steam from the bottom of the dryer. If any air is present, it goes along with it. In the return header the air drops by weight to the lowest possible point, or the Broughton Receiver, where it is released to atmosphere by the specially constructed, thermostatically controlled Broughton Air Valves. These valves allow the air to release automatically and so rapidly that the largest paper machine made can be started from cold to full drying capacity in less than twenty minutes. This complete evacuation of all air is the reason for the extreme operating flexibility of all paper and board machines equipped with the Broughton System.

Economy

Only that steam is used in each dryer that is consumed for drying and radiation. No blow thru or re-circulation is permitted. No mechanical external power of evacuation is required. The condensate is removed at the same tem-

Healy-Ruff Co.



for Paper Machines in Existence

perature as the steam in the dryers, no drop in pressure or reflash being allowed. The Broughton System permits the use of less steam per pound of water evaporated than any other scheme or system in existence.

Operating Pressures

Operating pressure is determined by machine heating surface, ventilation, and speed of production. The Broughton System will permit the lowest possible operating pressure as governed by these three factors. Live steam is never allowed to mix with the process steam, thereby allowing more even and constant back pressure. This, in turn, reacts towards the steadying of basic weights and moisture in the finished sheet. It invariably permits a slightly higher finished moisture content. The back-tender's first remark after a Broughton System installation is made is, "The machine is drying better." The system can be built for one pressure throughout, or for any number of pressures, as is desired.

Easy to Install

Small piping is all that is required. The largest paper machine made needs no larger than a three inch return header, three-quarter inch syphons, and a two inch pump discharge. The system can be built during the week and cut over on Sunday, no shut down being necessary.

Prices

Due to its extreme simplicity and low cost of installation, the cost of the Broughton System is well within the reach of any mill, regardless of size.

Write for further information.

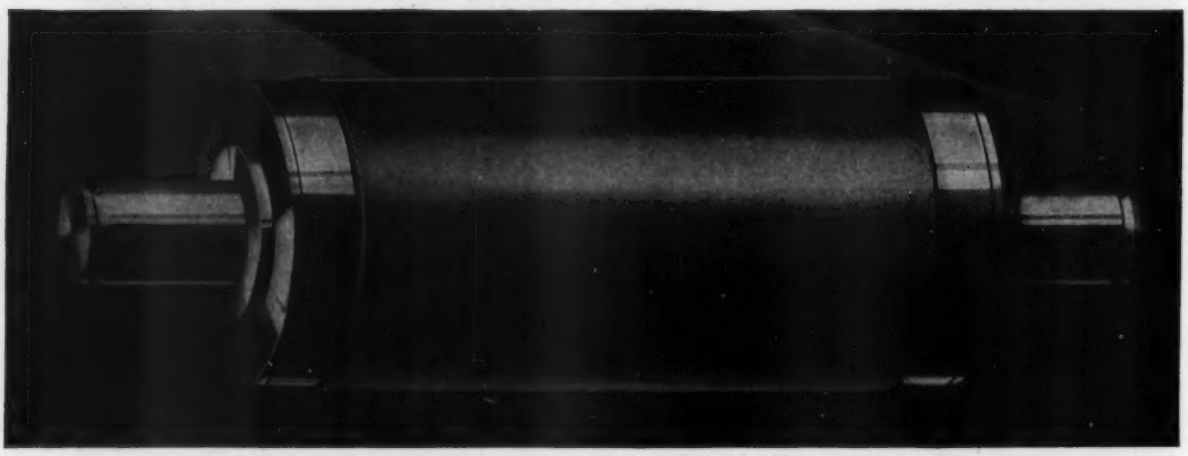
803 Hampden Avenue

St. Paul Minnesota

There are more than one hundred and fifty successfully operating Broughton Systems in the United States and Canada. A few representative jobs are as follows:

Inland Empire Paper Co., Spokane, Wash., 3. Cascade Paper Company, West Tacoma, Wash., 2. Paraffine Companies, Emeryville, Calif., 2. Fiberboard Prod. Co., Los Angeles, Calif., 2. U. S. Gypsum Co., Gypsum, Ohio, 1. U. S. Gypsum Co., Oakfield, N. Y., 1. U. S. Gypsum Co., N. Kansas City, Mo., 1. Marathon Paper Mills, Rothschild, Wisc., 3. Marathon Paper Mills, Menasha, Wisc., 2. Marathon Paper Mills, Ashland, Wisc., 1. Wausau Paper Mills, Brokaw, Wisc., 4. Dells Pulp & Paper Co., Eau Claire, Wisc., 3. Watab Pulp & Paper Co., Sartell, Minn., 2. Waldorf Paper Products, St. Paul, Minn., 2. Kimberly Clark Co., Kimberly, Wisc., 1. Kimberly Clark Co., Neenah, Wisc., 2. Laurentide Company, Grand 'Mere, P. Q., 7. Pejepscot Paper Co., Brunswick, Maine, 2. Hollingsworth & Vose Co., East Walpole, Mass., 3. Longview Fibre Co., Longview, Wash., 2.

Perkins Calender Rolls



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The high finishing qualities of Perkins Calender Rolls are the natural result of the longest and broadest experience in this highly specialized manufacture.

The Perkins roll shop is the largest in the world.

The Perkins organization is always prepared to build your rolls to meet exactly your production requirements.

Refills and remakes include the rolls of any manufacture, domestic or foreign, for any application in the paper industry.

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Rag Cutters
Stock Cutters
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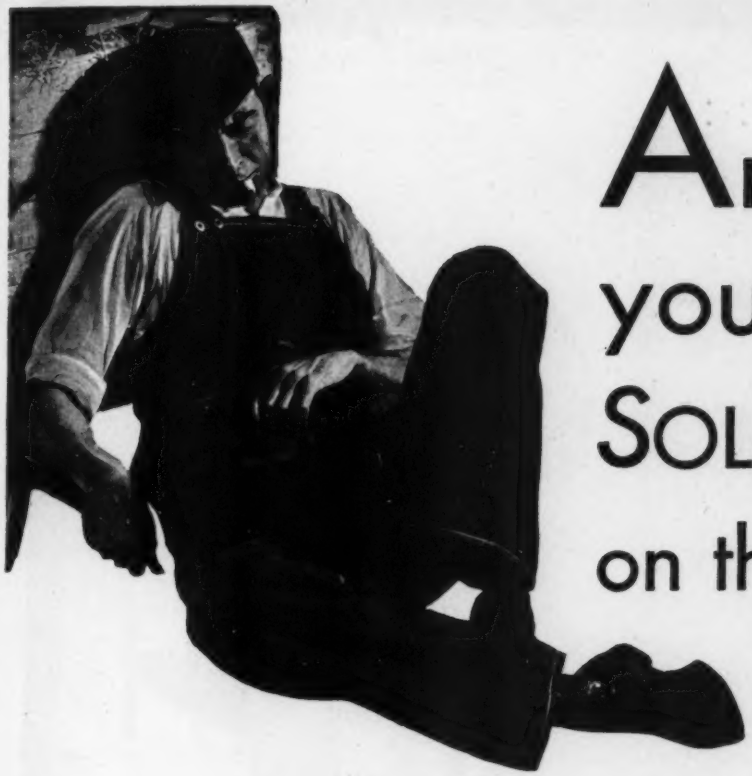


Are your scales SOLDIERING on the job?

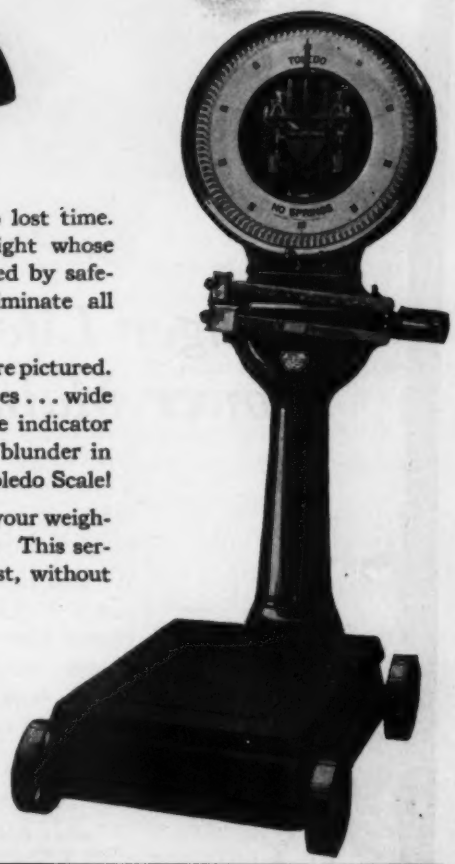
MANY a plant manager who fires the lazy worker still tolerates the lazy scale . . . the sluggish, inaccurate beam scale that soldiers on the job, wasting time, stealing profits.

Watch the lazy scale in operation. A poor worker, it needs a lot of supervision. Loose weights to be fussed with, poises to be shoved back and forth. Its bearings are sluggish; its beam wobbles uncertainly. With the job little more than half done, the lazy scale foists onto another the mental computation necessary to arrive at the final weight. A weight, that in the very nature of things, is seldom absolutely accurate.

What a difference with a Toledo Scale! The instant the load hits the platform the Toledo is on the job. The indicator moves at once, quickly comes to a dead stop. No waste motion; no lost time. There's the weight! A weight whose correct reading is surrounded by safeguards that practically eliminate all chance of error.

Note the Portable Scale here pictured. Big dial . . . large, clear figures . . . wide graduations . . . knife-blade indicator . . . Next to impossible to blunder in recording weights from a Toledo Scale!

For a thorough survey of your weighing needs, mail the coupon. This service is rendered without cost, without obligation of any kind.



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Without obligation to us, please have your representative call to survey our weighing operations.

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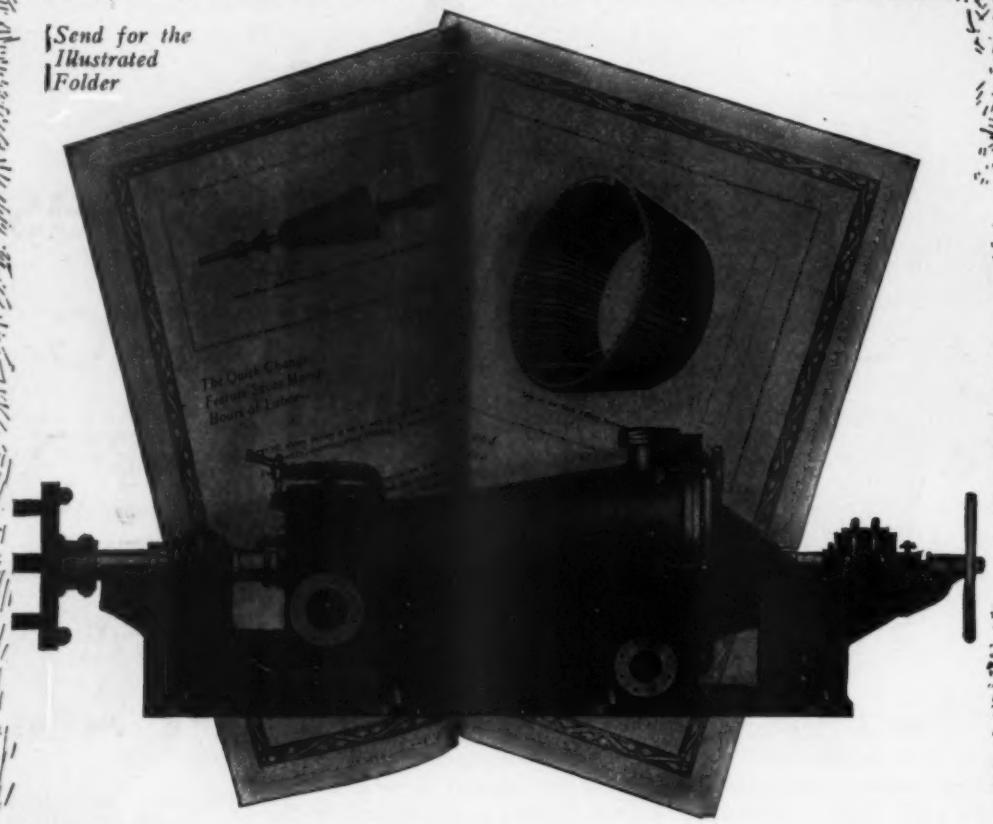

Longer Life Fillings Lower Maintenance Costs

Our Hercules Jordan with its SINGLE-UNIT CONSTRUCTION, is the highest exemplification of *Jordan Economy and Efficiency.* Wherever a new Jordan installation is required, the HERCULES most efficiently lowers production and maintenance costs.

We also manufacture Shell Fillings and Plug Liners for various makes of Jordans as follows:—Our Standard Fillings are of heat treated Chromium Manganese Jordan Engine Steel. Others of Bronze,—of Stainless Steel, of Tisco Manganese Steel and of Cast Strenes Iron. The quality of these products will materially lessen the cost of operation.

Wire or Write To-day for Engineering Data on the Hercules Jordan, and for Specifications and Prices on Plug Liners and Shell Fillings.

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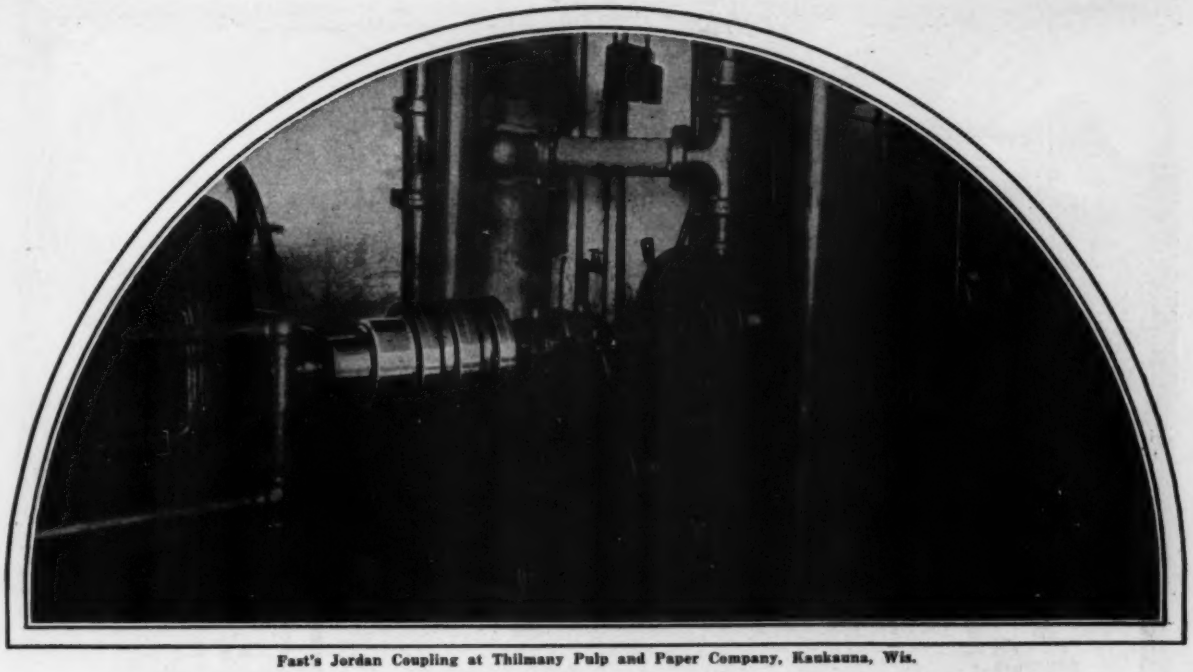


Fast's Jordan Coupling at Thilmany Pulp and Paper Company, Kaukauna, Wis.

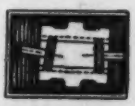
This Jordan Coupling Kills two birds with one stone

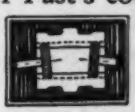
FIRST it provides adjustment of the Jordan plug by a new and simple arrangement—on a 5-inch shaft coupling providing for a full 12 inches of adjustment. It is so built that after the first free travel of over 4 inches, by simply releasing four draw-bolts it can be set twice again for 4 inches each time —giving a total travel of 12 inches—in a 5-inch coupling.

But the greatest advantage is the elimination of coupling repairs by eliminating flexible materials. No lacings, no flexible bushings, pins, springs or other flexible material to be replaced.

See the diagrams opposite. Two spur gears, one on each shaft end, are continuously meshed with the internal gears of a floating sleeve. The spur gears and sleeve revolve as one unit, misalignment being taken up between the lubricated faces of the gear teeth. Nothing to wear out. Nothing to be replaced. A simple piece of transmission equipment that will last as long as the connected machines.

Do not fail to send for the free pamphlet, "Solving Coupling Problems in Paper Mills", describing various types of Fast's couplings to meet every type of mill coupling problem.





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Please send me the free pamphlet on "Solving Coupling Problems in Paper Mills".

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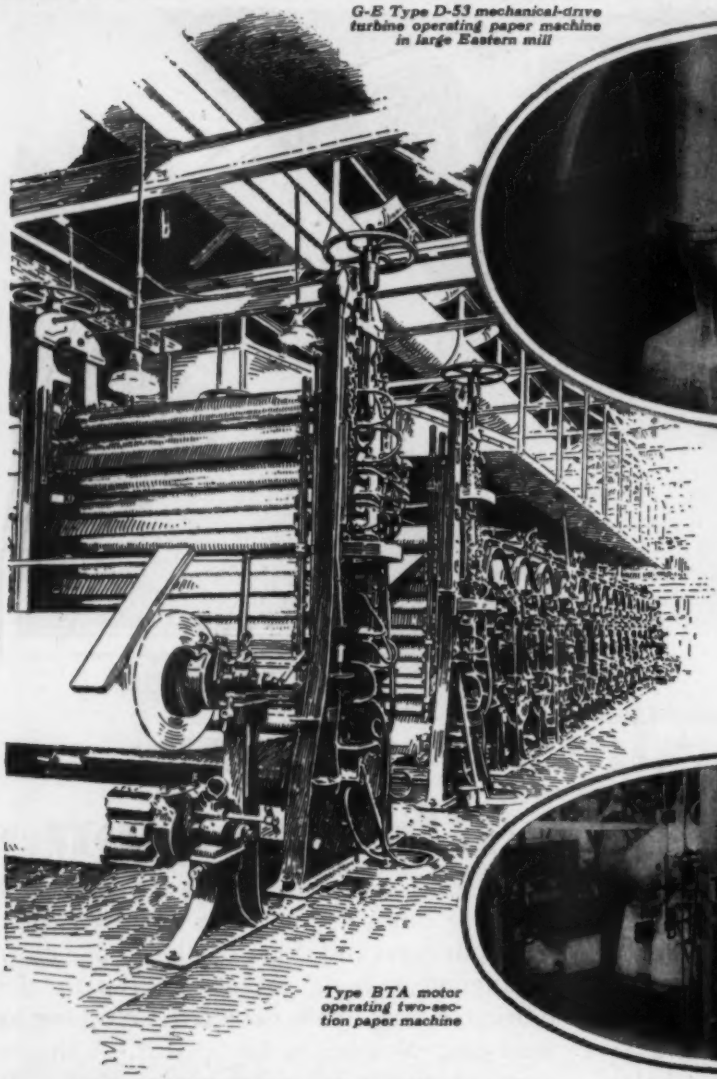
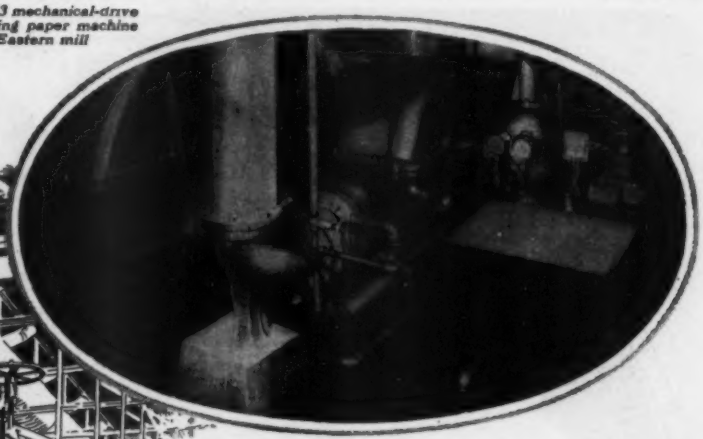
*Name of Mill*_____

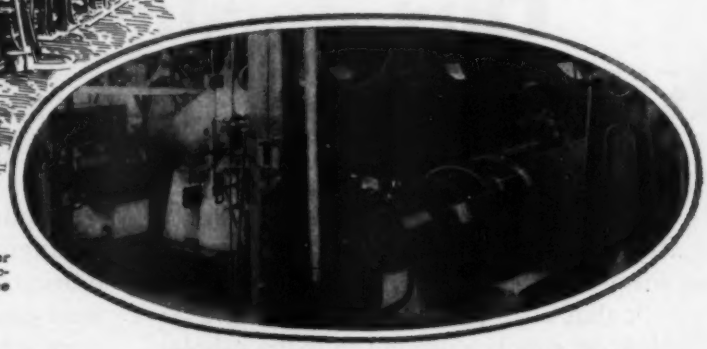
*Address*_____



G-E Type D-53 mechanical-drive turbine operating paper machine in large Eastern mill



Making good paper machines Better



Type BTA motor operating two-section paper machine

HUNDREDS of good paper machines, with backline too valuable to discard, could operate more efficiently with G-E electric or turbine drive.

In every instance this modernization results in higher economy, greater flexibility, lower maintenance, and increased cleanliness.

For alternating current, the Type BTA adjustable-speed motor operates directly from your power line without d-c. generators or motor-generator sets.

For direct current, the Types CD and LD motors have proved their worth in hundreds of installations.

Types DS-53 and D-53 turbines are recognized as the most efficient and economical mechanical drives for paper machines.

G-E specialists will be glad to discuss your problem with you.

Motorized Power
—fitted to every need

200-278

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GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

HELPING HANDS for SLUGGISH MACHINES

When competition licks the cream from your business; when rivals sell paper below your cost of production; when you fight uphill with men and materials to keep the red ink off your ledger, it's high time to check up on your mechanical equipment. You can't expect obsolescent equipment to keep pace with the modern production tempo. But it can, quite often, be rebuilt, repaired or restored to present day standards. We've had gratifying success doing this for other mills. Helped them produce more and better paper, easier, without investing a lot of money in new equipment. Perhaps we can do the same for you. At least, we'd like an opportunity to talk it over . . . without obligation.

The Bagley & Sewall Co.

Watertown, N.Y.

Pulp Beater at B. D. Rising Paper Company shown equipped with Bristol's Pulp Beater Recorder.

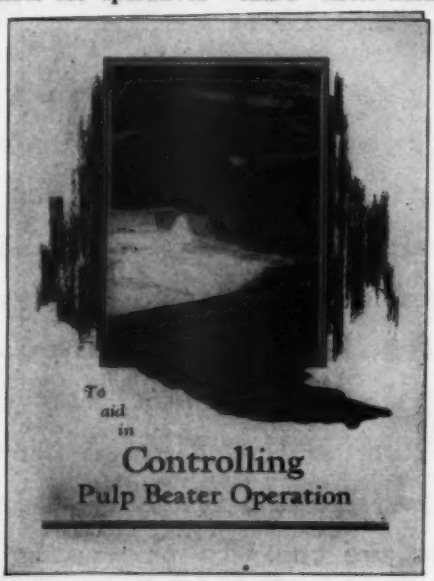
The same uniform results day after day under direction of BRISTOL'S Pulp Beater Operation Recorders

EVERY detail of Beater operation—from the moment the roll is first lowered, until it is lifted at the end of the beat—is clearly and accurately shown on the chart records made by Bristol's Pulp Beater Recorders. Exact time and extent of each roll change is automatically recorded—thus making it possible for operatives to successfully maintain the correct relation between bedplate and roll at all times.

Without such information as a check, beater operation is almost entirely dependent upon the experience and judgment of the operator or superintendent. And as no two operators seem to have the same ideas as to how certain grades of stock should be beaten, the result is often spoiled stock, an inferior grade of paper, or at best a paper that is not uniform in strength or texture.

Recorder Simplifies Control

As evidence of greatly improved production methods which can be effected thru use of Pulp Beater Recorders it is interesting to note that several mills, using the recorder as a basis, have worked out schedules by which over 95% of the beating is standardized on charts. To illustrate: the operator is instructed to start beating by dropping the roll until the instrument pen is on a certain graduation of the chart. After holding the roll in this position for a pre-determined time, it is again dropped until the pen reaches another selected graduation. And so on, until operation is completed.



*Bulletin No. 368

Nothing to Get Out of Order

The construction of Bristol's Pulp Beater Motion Recorder is very simple. The lever arm, as shown in accompanying illustration, passes up through a slot in the bottom of the case, attaches directly to the pen-arm and records on the chart without the aid of multiplying levers. Thus there are no complicated parts to get out of order.

Complete description in Bulletin No. 368, Write for a copy today.

Sales Engineering Service without obligation

The Bristol Company, Waterbury, Connecticut

New York, Detroit, Chicago, St. Louis

BRANCH OFFICES

Boston, Akron, Denver, Philadelphia, San Francisco, Pittsburg, Birmingham

For Bright, Fast-to-Light Yellow, Golden-Rod and Red Shades on Chemical Pulps

The following National Dyes will give exceptionally satisfactory results at a very low cost:

NATIONAL BRILLIANT PAPER YELLOW C
NATIONAL CROCEINE SCARLET FP CONC.

They are widely used in the coloring of bond, writing and cover papers

NATIONAL DYES

NATIONAL ANILINE & CHEMICAL COMPANY, Inc.

40 Rector Street, New York, N. Y.

CHICAGO PHILADELPHIA BOSTON CHARLOTTE
TORONTO PROVIDENCE SAN FRANCISCO

This 14-foot diameter rotary digester was built by Biggs for special process operation at the plant of the Sylva Paper Board Company, Sylva, N. C. All seams were electrically welded. Test, 225 pounds. The welding is done under Biggs procedure control, and has been approved and accepted by all important insurance companies for high pressure construction.

Riveted or Welded equipment built and erected by Biggs is now used all over the world for cooking and bleaching straw, grass, bagasse, wood fibre, cotton linters, and other materials used in manufacturing paper, boxboard, strawboard, and similar paper products.

Biggs Welded Vessels are accepted for installation in localities where the A.S.M.E. code has been adopted for unfired pressure vessels.

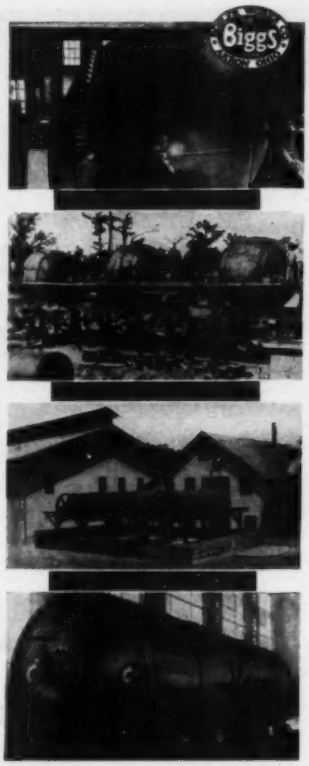
Biggs now offers you all-welded rotary, tumbling, sulphate and sulphite digesters, as well as other vessels in all-welded construction. The Biggs perfected welding process by which they are produced is the consummation of four long years of research and development. Biggs Welded Vessels insure you the utmost *uniformity*, *safety* and *reliability*.

The Biggs weld is stronger than the plate itself. Biggs Welded Vessels have been accepted and approved by all the leading insurance companies without reference to size or working pressure. Biggs All-welded Digesters and similar equipment built by Biggs are being accorded the same confidence as has been enjoyed by Biggs riveted construction throughout the paper and allied industries.

A reputation of more than 40 years' standing is squarely behind every Biggs welded vessel. Biggs' complete erecting service is also at your command. Whether your requirements are for welded or riveted types, for globe, cylinder, tumbling or stationary digesters, Biggs' experience and facilities will prove most valuable to you. Our story is sketched pictorially in our newest folder, "Unusual Steel Plate Construction". May we send you a copy?

THE BIGGS BOILER WORKS COMPANY
East Buchtel and Case Avenues, Akron, Ohio.
New York Detroit Chicago

BIGGS ***ROTARIES*** *for years of dependable cooking and bleaching..*



AMONG BIGGS INSTALLATIONS ARE:

Akron Paper Co., Akron, Ohio
American Straw Board Co., (10 plants), Akron, Ohio
Antioch Paper Co., Antioch, Calif.
Australian Paper Mills, Sydney, Australia

Ball Bros. Co., Noblesville, Ind.
Beckett Paper Co., Hamilton, Ohio
Beloit Box Board Co., Beloit, Wis.

California Paper & Board Mill Co., Antioch, Calif.
J. G. Cherry Co., Tama, Iowa
Cleveland-Akron Bag Co., Cleveland, Ohio
Celotex Company, New Orleans, La.
Consolidated Water Power & Paper Co., Appleton, Wis.

Diamond State Fibre Co., Bridgeport, Pa.

Empire Paper Co., Vincennes, Ind.

Fuji Paper Co., Tokio, Japan
Fir Tex Insulating Board Co., St. Helens, Ore.
Fibre Board Products, Inc., Stockton, Calif.
Fox Paper Co., Lockland, Ohio

Herman Garbe, Shanghai, China
Hinde & Dauch Paper Co., Sandusky, Ohio
Hinde & Dauch Paper Co., Fort Madison, Iowa
Harriman Co., Harriman, Tenn.

John H. Heald Co., Lynchburg, Va.

International Alcohol Corp., Fullerton, La.

Kalamazoo Paper Co., Kalamazoo, Mich.

Marshall Paper Co., Turner Falls, Mass.
Marshall Bros., Inc., Yorklyn, Del.
Montreal Paper Co., Sorel, P. Q.
Maizwood Prod. Co., Des Moines, Ia.

North Star Mfg. Co., Coffeyville, Kansas

Roanoke Fibre Board Co., Roanoke Rapids, N. C.
River Raisin Paper Co., Monroe, Mich.

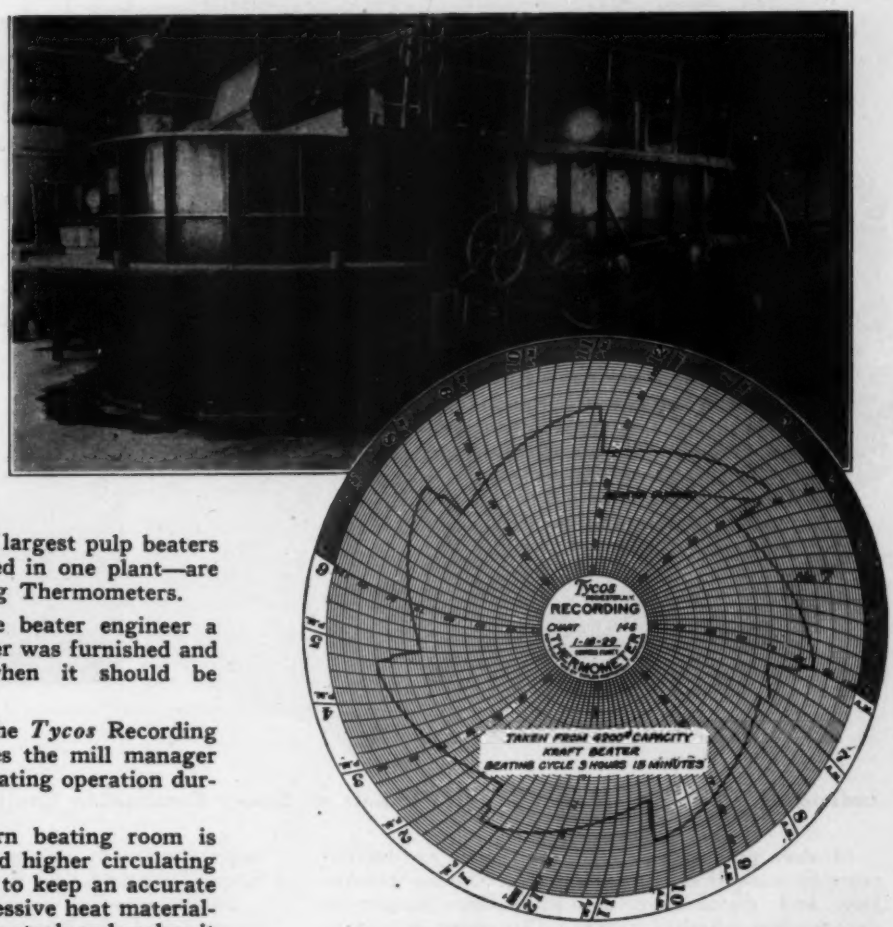
Standard Paper Mfg. Co., Richmond, Va.
Sylva Paper Board Co., Sylva, N. C.
Southern Extract Co., Knoxville, Tenn.

Peter J. Schweitzer, Elizabeth, N. J.
Port Huron Sulphite & Paper Co., Port Huron, Mich.

United Paper Board Co., New York City

Weis Paper Mill Co., Quincy, Ill.

...On the World's 7 Largest Pulp Beaters



THE operations of the 7 largest pulp beaters in the world—all located in one plant—are checked by *Tycos* Recording Thermometers.

These Instruments give the beater engineer a record of the time each beater was furnished and tell him approximately when it should be dumped.

A chart record written by the *Tycos* Recording Thermometer each day gives the mill manager an accurate history of the beating operation during the entire 24 hours.

As the trend in the modern beating room is toward greater capacities and higher circulating speeds, it is most important to keep an accurate check of temperatures. Excessive heat materially affects the character of the stock and makes it difficult to obtain the high degree of freeness often desired.

There are over 70 applications for *Tycos* Instruments in the Paper Industry. These include Industrial and Recording Thermometers, Pyrometers, Hygrometers and Hydrometers, Temperature, and Pressure Regulators, and Pressure and Vacuum Gauges.

Photograph of one of the 7 largest pulp beaters in the world, located in a Northern paper mill, and chart record taken from one of the *Tycos* Recording Thermometers used on these beaters. The Instrument on the beater shown is not visible as it is placed on the back, conveniently close to the one that can be seen on the second machine, in the left background.

Taylor Instrument Companies

Rochester, N. Y., U. S. A.

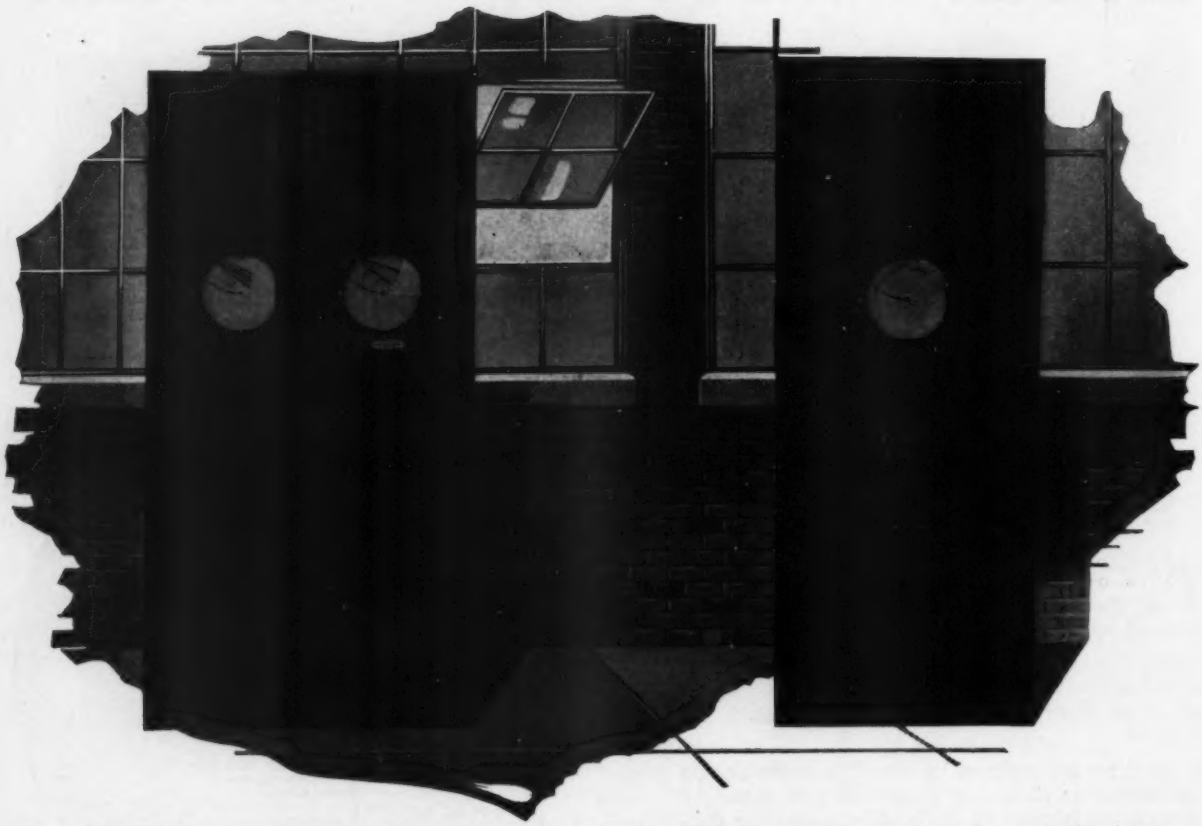
Canadian Plant ***Tycos*** **Building, Toronto**

Manufacturing Distributors in Great Britain, Short and Mason, Ltd., London—E. 17

Tycos Temperature Instruments

INDICATING - RECORDING - CONTROLLING

Automatic Control
For Another Pulp Mill



Individual Boiler and Master Control Panels of Bailey Combustion Control at Jno. H. Heald Co.

Modern pulp and paper mills reduce production costs by careful steam engineering. Steam generation and distribution are important factors in determining whether profits will appear in red or in black.

At Lynchburg, Va., steam costs in the plant of Jno. H. Heald Co., are kept at a minimum by the use of Bailey Automatic Combustion Control, Bailey Boiler Meters, Temperature Recorders, Multi-Pointer Gages and Centralized Bailey steam and water distribution meters. Steam pressure is maintained at the desired point and fuel and air are automatically proportioned by the automatic control so as to secure the highest combustion efficiency consistent with economical operation.

Satisfactory operation of Bailey Meters and Control at Lynchburg has resulted in the Management Engineering and Development Co. of Dayton, Ohio, Engineers for Jno. H. Heald Co. ordering a similar group of Bailey Meters and Control for the new power plant of the Mead Straw Pulp Co., Chillicothe, O.

Progressive pulp and paper mills are securing low steam costs which leave ample room for profit by the use of Bailey Metering Control and Regulating Equipment.

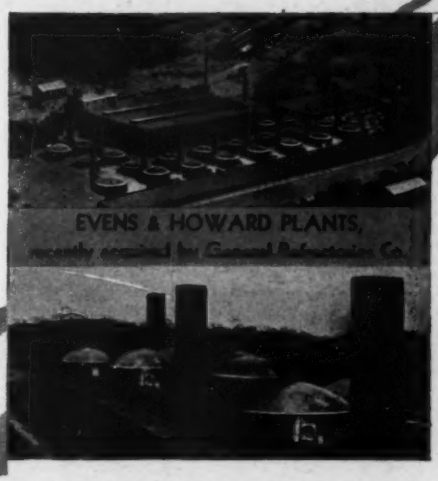
Write for Bulletin No. 181. It describes Bailey Control.

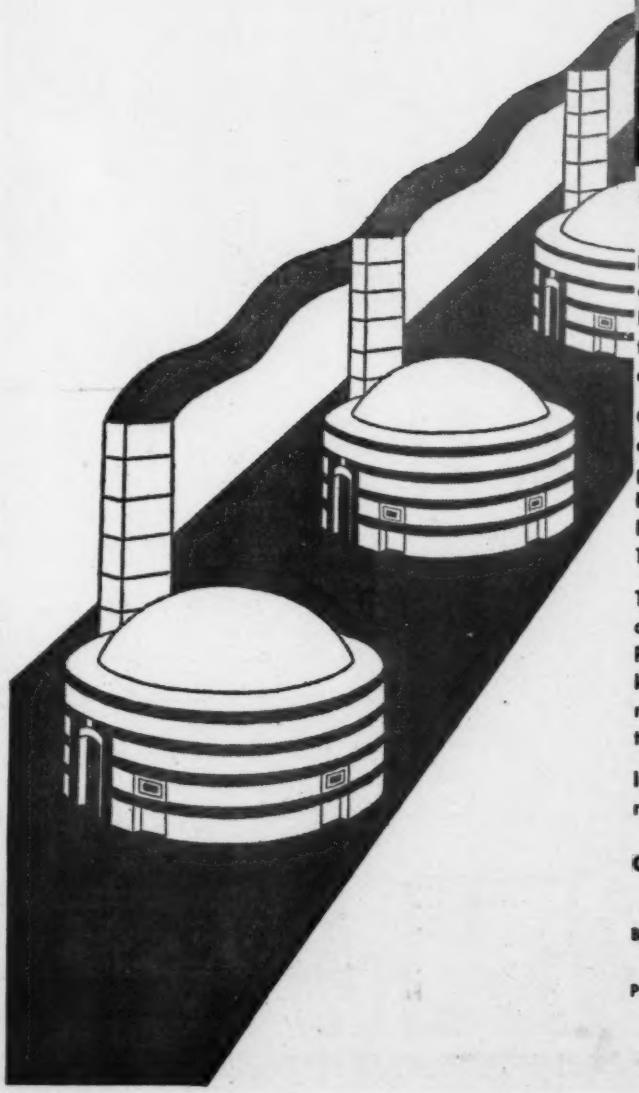
BAILEY METER CO.
1058 IVANHOE RD. CLEVELAND, OHIO

Bailey Meter Company Limited, Montreal, Quebec.

NOW EVENS & HOWARD is a part of GENERAL REFRACTORIES

.. a more complete refractory service than ever before ..





WITH the acquisition of the refractories properties of the Evens & Howard Fire Brick Co., comprising three large, modern plants at St. Louis, Mo., and Stevens Pottery, Ga., General Refractories Co. offers to refractory users throughout the country a more complete service than ever before.

General Refractories now offers you more extensive manufacturing facilities with 18 plants distributed in Pennsylvania, Maryland, Kentucky, Illinois, Missouri and Georgia, having a combined capacity of nearly 1,200,000 brick per day.

The well known Evens & Howard brands will continue to be manufactured by General Refractories and will benefit by the G. R. knowledge of refractory requirements and research facilities that have already proved their worth.

It is our constant aim to produce refractories best suited for individual requirements.

GENERAL REFRACTORIES COMPANY

106 South 16th St., Philadelphia, Pa.

Boston Buffalo Chicago Cleveland
Detroit Indianapolis New York
Pittsburgh St. Louis San Francisco

Evens & Howard Division:—St. Louis, Mo.

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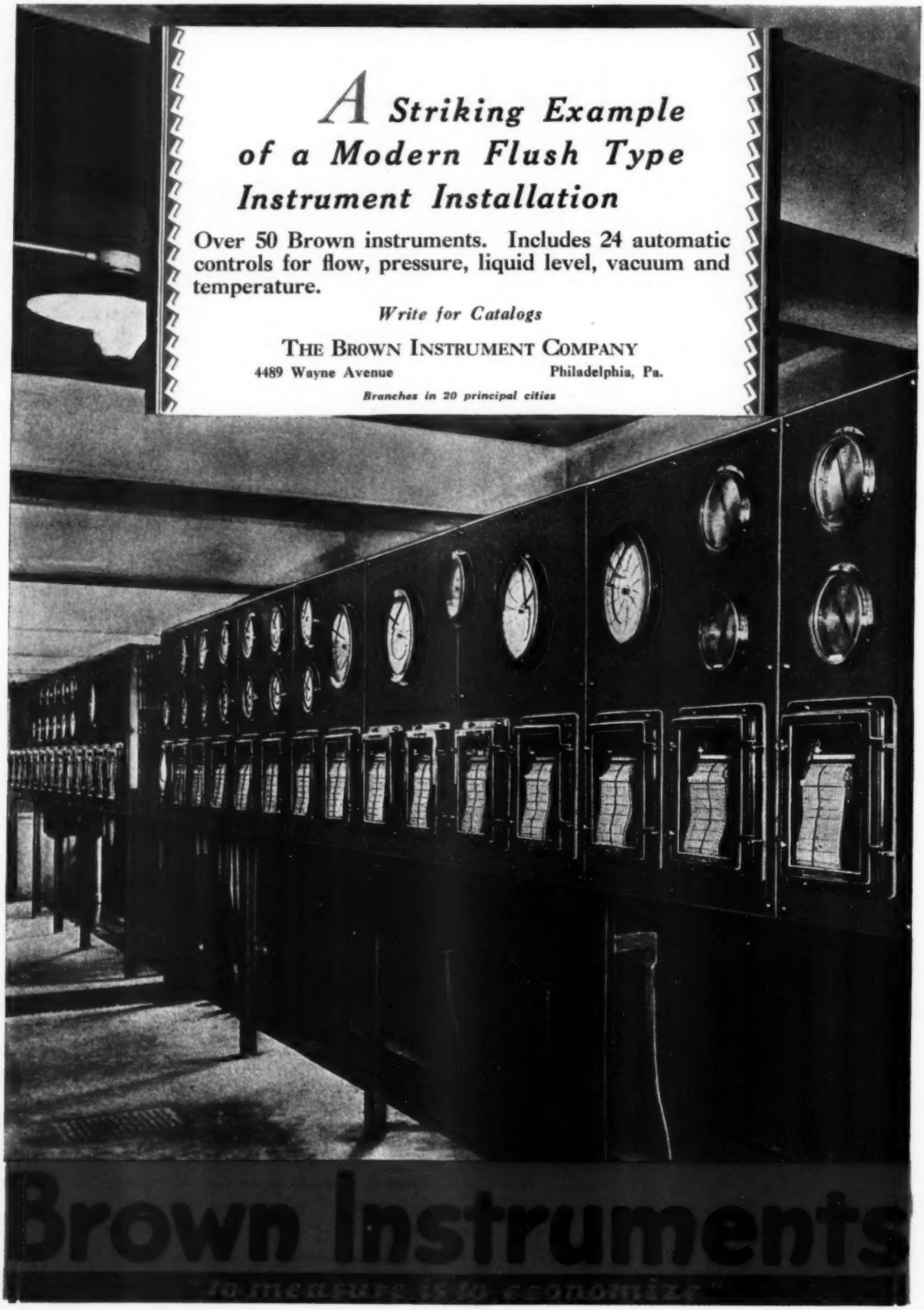
A Striking Example of a Modern Flush Type Instrument Installation
Over 50 Brown instruments. Includes 24 automatic controls for flow, pressure, liquid level, vacuum and temperature.
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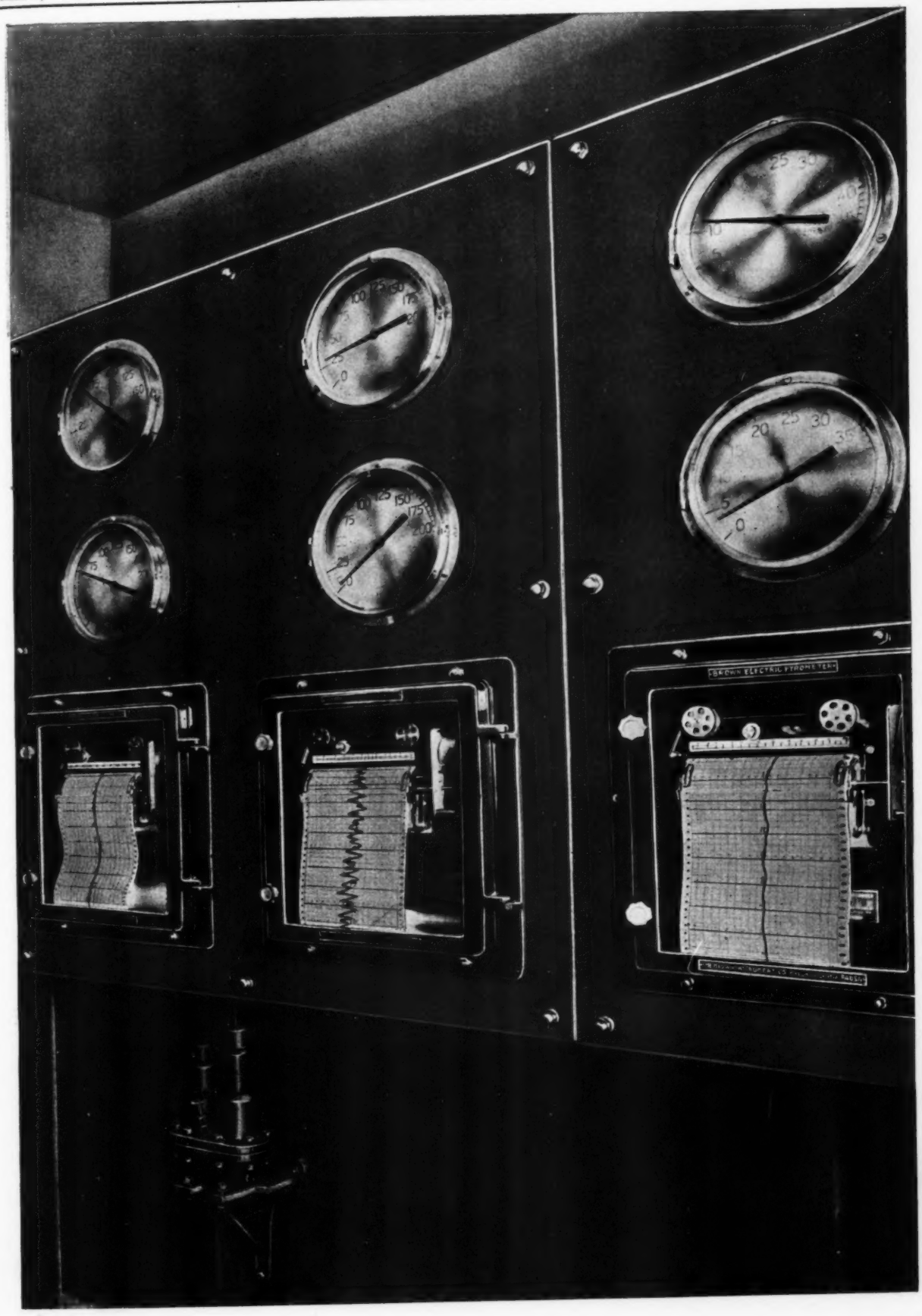
THE BROWN INSTRUMENT COMPANY
4489 Wayne Avenue Philadelphia, Pa.
Branches in 20 principal cities
Brown Instruments
To measure is to economize

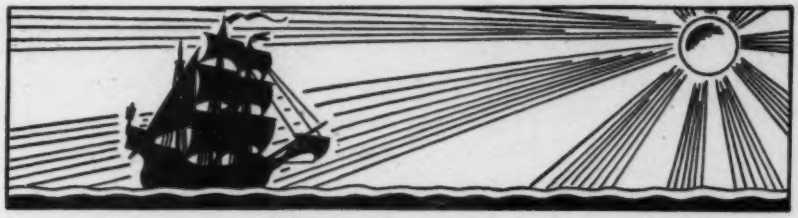

BROWN ELECTRIL PYROMETER

"Bound to get there"
REG. U. S. PAT. OFF.

. . . . . Regardless of the kind of shipping container you use, there is an Acme Strapping Tool and a size of Acme Nailless Band that will safely reinforce it—quickly and economically. . . . . Special Acme tools have been designed for strapping every type of shipment, from parcel post packages on up to bundles weighing tons. . . . . Entire loads of freight are strapped in secure damage-proof units with Acme Unit-Load.

Write to Acme Steel Company, General Office, 2832 Archer Ave., Chicago, for literature.

1880 ACME STEEL COMPANY 1930
OUR GOLDEN ANNIVERSARY



CASLON BOND

Embarks on a *New Adventure* . . . . *with* Two New Companions

Caslon Bond started the year with two new companions—Caslon Ledger and Caslon Mimeograph Bond.

Each of the newer papers offers in its field the same well-known quality at popular price that rapidly brought Caslon Bond popular recognition and approval.

Introduced on the logical basis of offering a previously unavailable value, Caslon Bond made rapid strides so that its local representation shortly grew from a half dozen agents to a long list of the nation's leading paper merchants.

In introducing Caslon Ledger and Caslon Mimeograph Bond, it is the aim of The Munising Paper Company to perpetuate the sound value and known quality which paper-buyers, printers, paper merchants have come to expect of Caslon Bond.

CASLON BOND

Twelve colors and white, all weights and sizes, envelopes to match

CASLON LEDGER

In White and Buff, and four weights

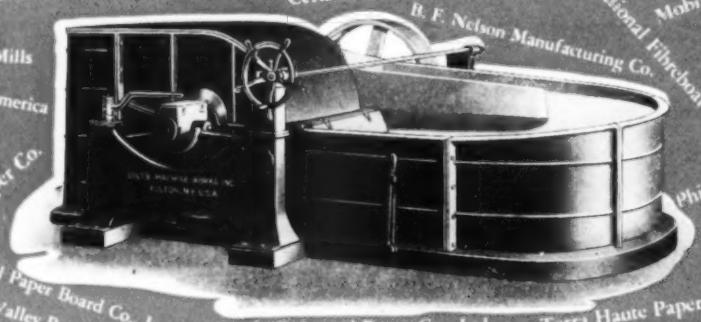
CASLON mimeograph BOND

Mimeograph surface and bond strength

MUNISING PAPER

THE MUNISING PAPER COMPANY · *Manufacturers* · MUNISING, MICHIGAN

THE DILTS



NEW TYPE BEATING ENGINE HAS A BACK-GROUND OF MANY SATISFIED USERS

DILTS MACHINE WORKS, Inc.

FULTON, N. Y.

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STANDS FOR QUALITY IN NITRIC ACID

SYMBOL of QUALITY KALBFLEISCH CHEMICALS FOR OVER A CENTURY

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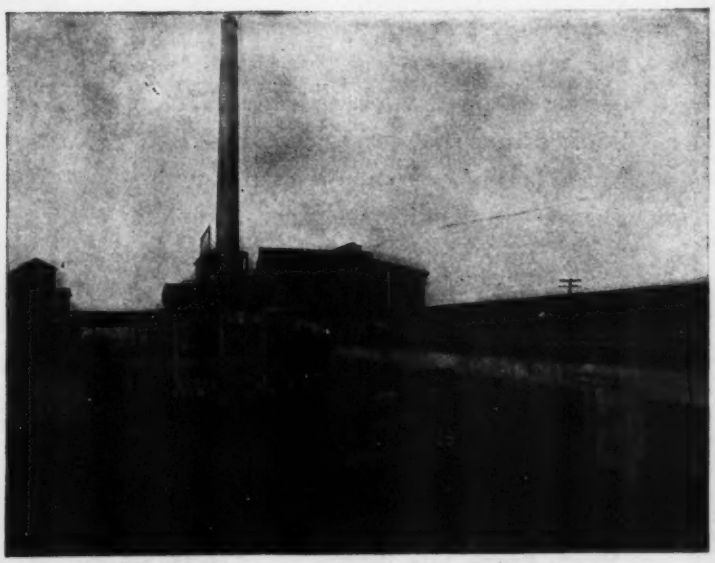
Kalbfleisch Nitric Acid is *water white.* It is produced by a process that gives an exceptionally high quality acid. In fact, this excellence is so pronounced that our regular acid in many cases is substituted for a so-called Chlorine-free product.



One end of loading platform
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Moreover, we offer constructive cooperation in problems incident to the application of all Kalbfleisch products. You are cordially invited to make regular use of this technical service.

PAPER

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Conquer Corrosion

Corrosion costs industry $225,000,000.00 a year. How much of it do you pay?

Your share is the depreciation of your buildings and equipment, the loss of time, and the labor spent repairing them. These lower your profits. Corrosion, even as severe as that shown here, can be stopped with NITROSE, "the liquid armor that corrosion cannot eat." Takes less labor to apply, stands up under severe conditions, gives complete, long time protection. Investigate! You'll be as enthusiastic as the long list of other companies who are using this "liquid armor that spreads like paint." Write for free sample—make your own test on your own equipment.

The NITROSE Company

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Stocked for immediate shipment in steel containers at

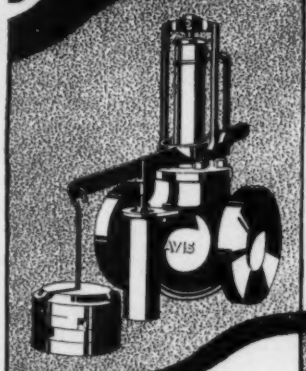
Peoria, Cleveland, Los Angeles, New York City, Rochester, San Francisco, Detroit, St. Paul, Seattle, Pittsburgh, Kansas City, Montreal, Can., San Juan, Porto Rico

NITROSE

DAVIS

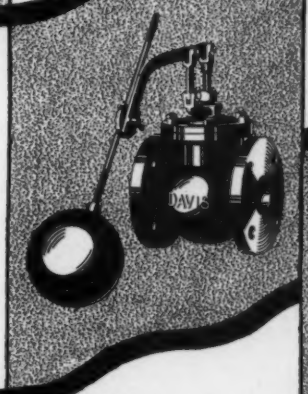
VALVE SPECIALTIES

for automatic-pressure and flow control



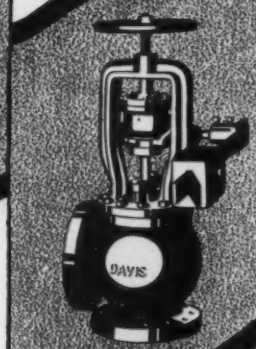
Pressure Regulator

Reduces boiler pressure to the correct low pressure desired, and maintains it automatically, and dependably.



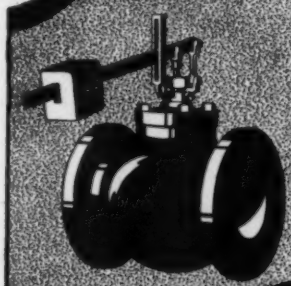
Float Valve

A simple, single seated valve for controlling liquid levels in open tanks or reservoirs. No leaking or sticking.



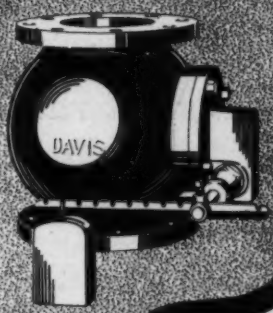
Stop and Check Valve

Automatically prevents a reverse flow from header to boiler. Protected from scale formation and expansion. Can be hand tested. Visible action.



Balanced Valve

For every service requiring a valve unaffected by the internal pressure. Operated by some force exerted on the lever.



Back Pressure Valve

The original semi-balanced valve for maintaining an exhaust back pressure. Will not stick or leak.

Exhaust Relief Valve

Holds tight under high condenser vacuum, relieves to the atmosphere at a fraction of a pound pressure. Maintenance negligible.

G. M. DAVIS REGULATOR COMPANY

414 Milwaukee Ave., Chicago, Ill.
New York 71 Fulton Street

Trust Davis Valves on your most important jobs.

PI3-Gray

Where Air Power backs service to 650,000 Customers daily

The new Balanced Angle Compressor for the Railway's paint shop. It is direct connected to synchronous motor. The first Sullivan compressor bought by the company 21 years ago, is still in operation.

—a great railway swells profits with Balanced Angle Compressors

Fifty-six hundred trains speed daily over this elevated railway line. During rush periods the trains enter the downtown district eighteen seconds apart—discharging 1500 passengers a minute.

Safe, fast service requires cars in good condition. Profits for the road make low upkeep essential. And alert management has found numerous ways to speed repairs, and swell profits — *with compressed air.*

Air spray painting has reduced hand labor from sixteen hours, to two hours, per car. Compressed air cuts out rivets, sets new ones, drills, sandblasts, runs a disc sander on flat surfaces, tests brakes, hoists materials.

And now, the management has taken another step in economy. After using Sullivan single stage compressors for twenty-one years, they have adopted the modern Sullivan Balanced Angle—the choice of leaders in every industry.

Send for Catalog 83-J

BALANCED ANGLE COMPOUND — SULLIVAN

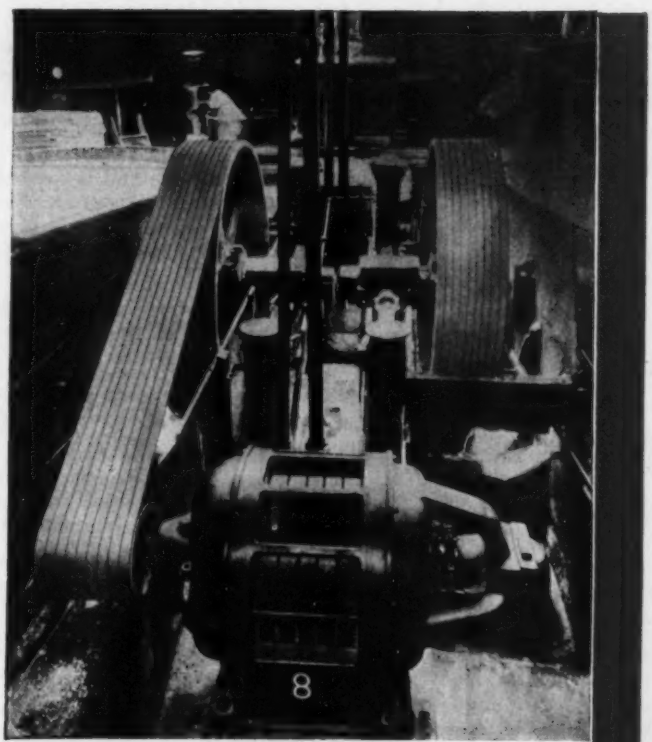
SULLIVAN

TRADE MARK

Sullivan Machinery Company, 716 Wrigley Bldg., Chicago, U. S. A.

Offices in all principal cities of the world

Here's the DRIVE for Paper Mills!



Dayton Cog-Belt Drive on a 75 H. P. Beater

Dayton

COG-BELT DRIVES

Dayton Cog-Belt Drives, because of their extra rugged construction, are more powerful than ordinary drives. They prevent delays and shut-downs. The firm seating of the die-cut belts in the pulley grooves insures a firm grip, positive speed and smooth starting and running. The cog construction assures flexibility—there's no buckling . . . no getting out of shape.

Dayton Cog-Belt Drives reduce factory overhead and lower production costs

Dayton Cog-Belts run cool . . . are not affected by moisture . . . have longer life. They are easier on bearings because less tension is necessary. They take less floor space because driving and driven machinery can be placed closer together. They require smaller pulleys because they are more flexible. And no lubrication is necessary . . . they save labor and they are *clean.*

But get *all* the facts about these revolutionary drives. Send for a Dayton Cog-Belt catalog and a free sample section of the belt itself. Mail the coupon . . . today.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO

Factory Distributors in Principal Cities and all Westinghouse Electric and Manufacturing Company Sales Offices

THE DAYTON RUBBER MFG. CO.,
Dept. No. A-61, Dayton, Ohio
Gentlemen:—I'd like to have a free sample section of the Dayton Cog-Belt and a Dayton Cog-Belt catalog.

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Position.....

Firm Name.....

0-21

Firm Address.....

FACTS *about* *the* TAYLOR UNIT

A few Taylor Installations

Berlin (Germany) Municipal Plant
Columbus Railway, Power & Light Co.
Consolidated Gas, Electric Light & Power Company
Consumers' Power Co.
Dayton Power & Light Co.
Detroit Edison Co.
Edison Electric Illuminating Co. (Boston)
Fort Dodge Gas & Electric Co.
Iowa & Nebraska Railway & Light Co.
Iowa Railway & Light Co.
Italian Edison Company
Kansas Gas & Electric Co.
London (Eng.) Power Co.
Lynn Gas & Electric Co.
Ohio Edison Company
Ohio Public Service Corp.
Philadelphia Electric Co.
Potomac Electric Power Co.
Riverside Power Co.
Virginia Electric & Power Co.
United Electric Light & Power Co.
Ball Brothers Co.
Barrett Company
Brown Corporation
DeLaval Steam Turbine Co.
Ehret Magnesia Mfg. Co.
Fisher Body Corporation
Ft. Frances Pulp & Paper Co.
General Electric Co.
Michigan Alkali Co.
National Sugar Refining Co.
New Departure Mfg. Co.
New York & Pennsylvania Co.
Packard Motor Car Co.
Pittsburgh Plate Glass Co.
Procter & Gamble Co.
Rhinelander Paper Co.
St. Maurice Valley Corp.
Timken Roller Bearing Co.
Viscose Company
Western Electric Co.
Willys-Overland Co.

The Taylor Unit is a complete coal-burning system for the industrial plant or central station.

The Taylor Unit is made in sizes to fire any boiler and imposes no restrictions on the type or size of boiler used.

With a Taylor Unit you can burn the coal that is most economical for your particular plant.

You can change from one kind of coal to another whenever it is desirable to do so.

The Taylor Unit permits you to operate at any desired rating.

With the Taylor Unit you can bank your boilers indefinitely, then go to several hundred per cent of rating in a few minutes.

The Taylor Unit operates with the highest efficiency possible in any coal-burning device. Tests have shown results within a few per cent of the theoretical maximum.

Efficiency is sustained at high ratings. Slag formations on furnace walls are prevented and wall erosion eliminated by the use of A-E-CO Furnace Armor (Water cooled furnace walls).

Taylor combustion is smokeless.

Full advantage can be taken of the economies and improved combustion resulting from the use of preheated air.

Ashes are discharged in a form that makes them a salable by-product.

High fuel-burning capacity is provided in proportion to the grate area of the furnace. The heat release frequently runs above one million b.t.u. per hour per sq. ft.

Combustion is complete and is carried on with a minimum of excess air. Repeated analyses show as high as 16% CO_2 in the first pass of the boiler, with no CO.

The loss due to carbon in the refuse runs as low as 0.2% of the heat units in the coal fired.

In many plants the power consumption is as low as 4 kw. per ton of coal burned.

Air is supplied to every part of the fuelbed in a multitude of small streams —as many as 22,000 in a large stoker.

The sensible heat of the ashes is recovered and returned to the furnace by air admitted to the ash pocket.

Crusher rolls are massive and give complete control of the ash discharge.

Undercut tuyeres prevent clogging that would obstruct flow of air into the fuelbed.

Fuel is under positive control from the time it enters the furnace until the ashes are discharged.

All parts exposed to wear are easily renewable.

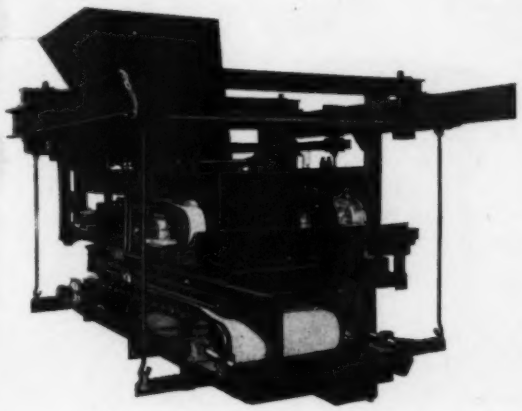
Send for new catalogue—

Just off the press, it describes the various types of Taylor Stoker and illustrates numerous installations of Taylor Units. It will be sent on request to any engineer or executive interested in the economical burning of coal.

AMERICAN ENGINEERING

AMERICAN ENGINEERING COMPANY, 2409 ARAMINGO AVENUE, PHILADELPHIA
IN CANADA: AFFILIATED ENGINEERING COMPANIES, LTD., MONTREAL, P. Q.

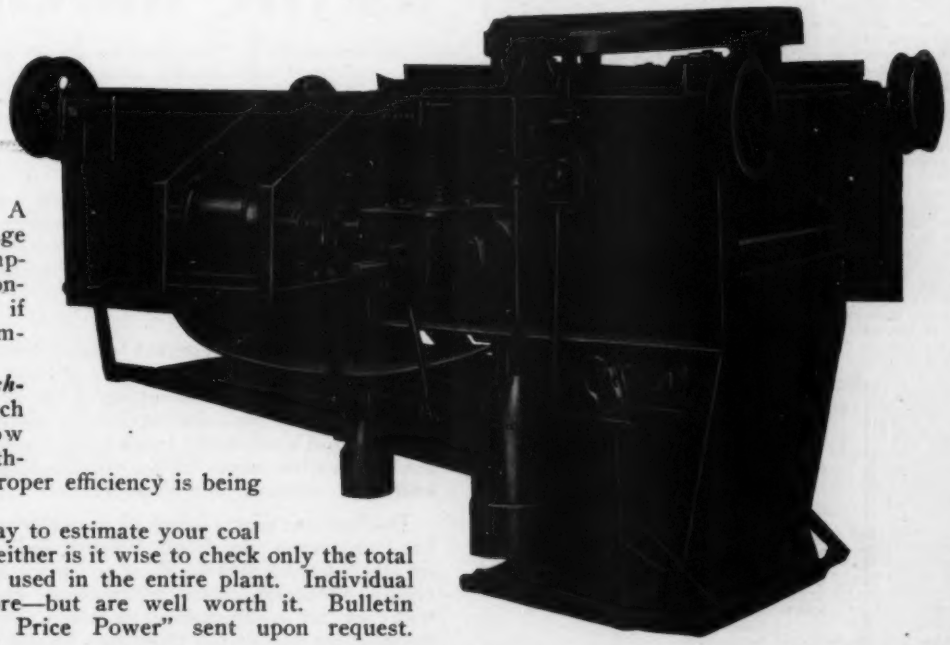
THE CONVEYoWEIGH
for your Wood Chips



An accurate knowledge of chips put into digesters is valuable in checking costs and in manufacturing good paper.

The CONVEYoWEIGH can be installed to feed in a straight line, at an angle, or in the opposite direction. Details of the machine are contained in our catalog 1629-S.

The RICHARDSON COAL SCALE
for your Boiler Room



Fuel consumption of boilers must be constantly checked to prevent waste. A small percentage of over-consumption means a considerable loss if not detected immediately.

Install a ***Richardson*** on each boiler and know constantly whether or not the proper efficiency is being maintained.

It does not pay to estimate your coal consumption; neither is it wise to check only the total amount of coal used in the entire plant. Individual Scales cost more—but are well worth it. Bulletin 2129-S, "What Price Power" sent upon request.

RICHARDSON SCALE COMPANY
CLIFTON, NEW JERSEY

Chicago New York Pittsburgh Philadelphia
Omaha Wichita Minneapolis
Atlanta Los Angeles Gulfport

As important as the machine

A statement that "lubrication is as important as the machine" may evoke strong protest, but there can be no dodging the fact that lubrication is the life blood of any machine . . . that it is a positive factor in the machine's service life and operating efficiency.

Only by correct lubrication can equipment be expected to function at its rated capacity and give a profitable length of service. Probably no other element entering into equipment maintenance will pay larger dividends if studied carefully and intelligently, than lubrication.

So important has correct lubrication become that progressive manufacturers give it the attention and thought equal to the selection of the highest priced machine. One manufacturer who placed his lubrication upon a scientific basis a year ago has lowered his lubrication costs 25%, cut his maintenance in half and reduced his depreciation charges 20%.

During our many years of experience in developing lubricants we have helped Industrial plants throughout the Middle West to improve their lubrication methods. Our lubricaiton engineers will welcome an opportunity to assist you with your lubrication problems. They may be able to show you savings well worth while.

Hear the Chicago Symphony Orchestra every Sunday at 2 p. m., Central Standard Time, over the following stations:

WGN	Chicago
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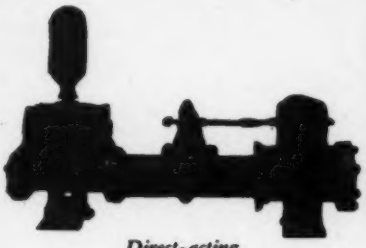
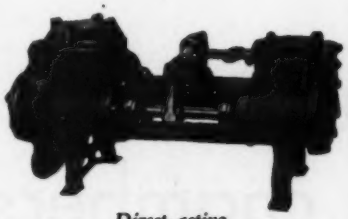
1427 **LUBRICANTS FOR ALL INDUSTRY**

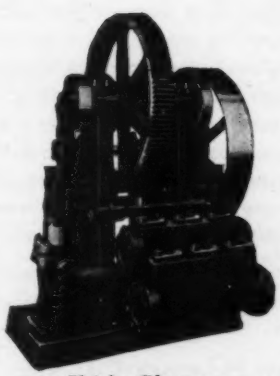


Direct-acting Simplex Steam Pump

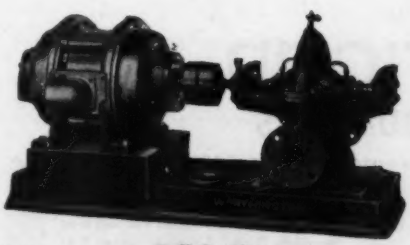


Direct-acting Duplex Steam Pump

Duplex Piston Power Pump



Triplex Plunger Power Pump



Ball Bearing Centrifugal Pump

P-41

Conditions... FIXED *Pump Design...* Variable

HERE, in five words, is the situation surrounding the selection of pumps for 99 out of 100 installations. The conditions under which the pump is to be used are fixed. Capacity, head, speed, location, temperature, viscosity of liquid, and the like, are established. The pump must fit the conditions, *not vice versa.*

Worthington need ask no favors. Among the hundreds of combinations of type, drive and size, there is a Worthington Pump which meets each set of conditions. *No compromise is necessary.*

When you have a pumping problem, call in a Worthington representative. He can give you the benefits of Worthington's 89 years in the manufacture of pumping and power service equipment.

WORTHINGTON

PUMPS
COMPRESSORS
CONDENSERS *and* Auxiliaries
DIESEL ENGINES
GAS ENGINES
FEEDWATER HEATERS
WATER, OIL *and* GASOLINE METERS

Literature on Request

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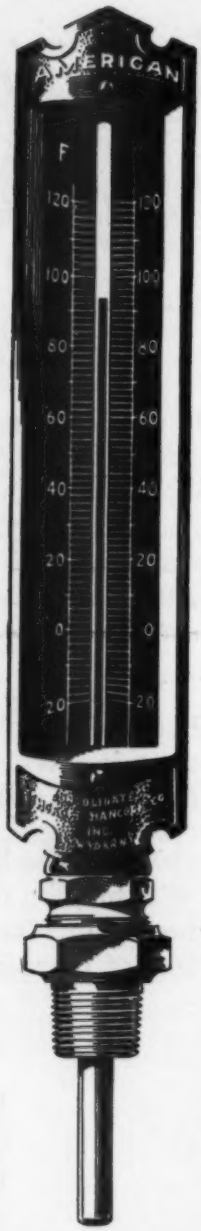
WORTHINGTON

Monel Metal bulb chambers



ALL American Glass Front Indicating Thermometers are provided with Monel metal bulb chambers as standard equipment. This is of decided advantage to the user . . .

Sensitive thermometers require the use of mercury in the space between the bulb and the outer protecting sheath known as the bulb chamber. Ordinarily these chambers are made of steel, copper-plated on the outside. Steel provides a satisfactory container for the mercury, but the copper-plating is not a sufficient protection against corrosion. As a consequence the life of many thermometers is shortened by stems breaking, due to corrosive action.

The substitution of Monel metal for steel eliminates entirely any danger of corrosive action, and assures a long and useful life to a quality product.

Consolidated Ashcroft Hancock Co., Inc.
Bridgeport, Conn.

Subsidiary of Manning, Maxwell & Moore, Inc.

CONSOLIDATED ASHCROFT HANCOCK

American INSTRUMENTS

Specify Catalogs Desired:

American Dial Thermometers	G-41	American Recording Gauges	E-41	Ashcroft American Gauges	T-41
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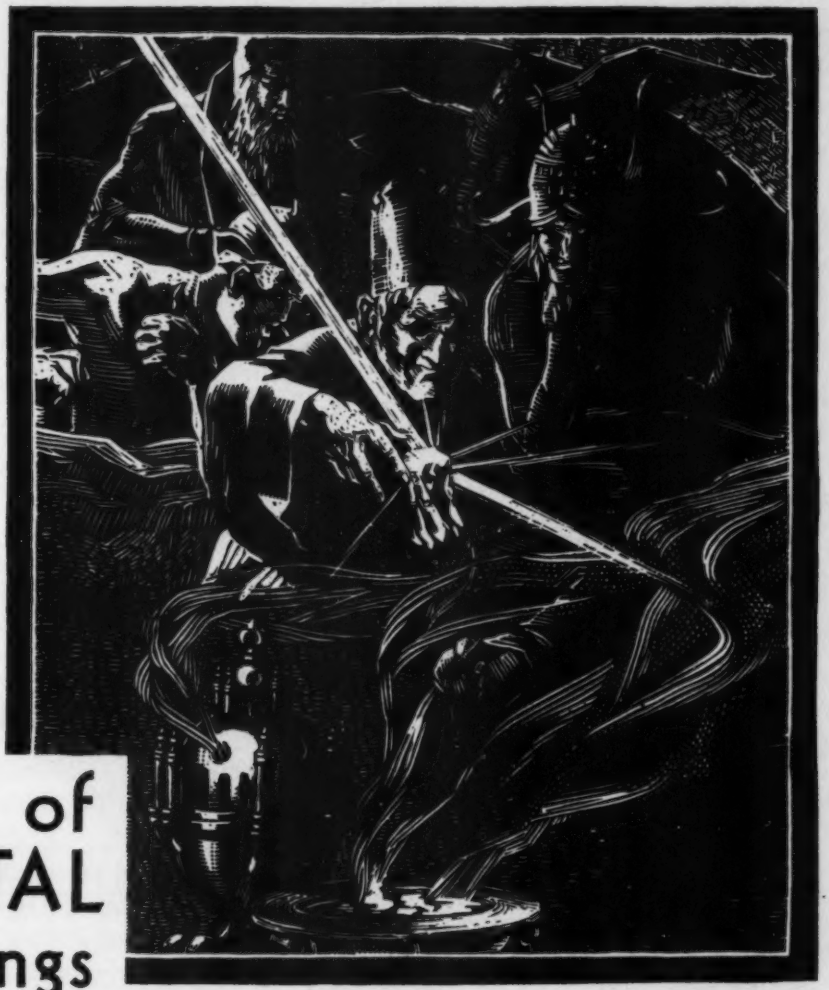
American Recording Thermometers	H-41	American Gauge Testers	D-41	Consol. American Relief Valves	V-41
American Quality Gauges	A-41	American Tachometers	J-41	Hancock Globe & Check Valves	X-41
American Temperature Controllers	R-41	Ashcroft Power Control Valves	M-41	Metropolitan Injectors	Y-41



The MAGIC of the CRYSTAL ▲ ▲ ▲ brings Greater Accuracy to Industry

Product of ancient times, the Crystal was thought to have magic powers, for it opened a strange new world to the dazzled eyes of its discoverers.

Product of modern times, Crystal Windows of optical glass still open upon magic worlds. Through application of the principles of optics, man's knowledge is constantly being widened . . . . new fields explored . . . . new standards set.

As America's Leading Optical Institution, Bausch & Lomb brings new aids to paper making. No longer is the unaided human eye the judge of what constitutes quality in materials and accuracy in manufacturing processes. Bausch & Lomb scientific instruments replace guesswork with scientific control of each step of production, bringing standardization of product that builds prestige for the manufacturer.

Bausch & Lomb Optical Co. » 630 St. Paul Street » Rochester, New York

BAUSCH & LOMB

Some B & L Products for Paper Making

Microscopes, Colorimeters, Spectroscopes, Microtomes, Photomicrographic Equipment,

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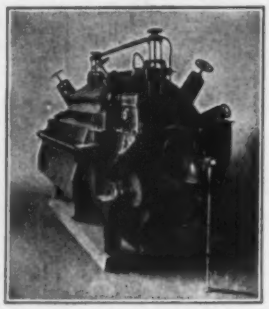
BAUSCH & LOMB



In Effect, These Are Control Stations

Oliver United equipment for paper mill service provides effective control stations for the flowsheet.

For example:

High Density Thickener .....takes the stock with its probably varying consistency and delivers to the bleachers, stock of remarkably uniform consistency and holds it at the required point. Here, consistency to bleachers is controlled.

Bleach Washer .....thoroughly washes chlorides from the stock. Here, quality of pulp is controlled.

Lime Mud Filter .....takes the mud and practically frees it of alkali, less than 1% remaining. In addition much less (50%) wash water is required than in decantation systems and moisture content of cake is controlled, maintaining lime in a more suitable condition for reburning. Here, recovery of chemicals is controlled.

These are but three of the several Oliver United machines available for paper mill work. There are deckers, save-alls, stock washers, board machines. Each, in its action, controls something of vital importance. Each can be fairly said to constitute an important control station.

With Oliver United units your plant operation will be under better control. Let our engineers tell you how and why.

OLIVER UNITED FILTERS INC.

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The fact that over 90% of the wall and insulation boards now manufactured are dried with Coe Board Dryers is a significant index of Coe merit.

The additional fact that these boards, a few of which are shown above, are made from a wide variety of mineral, wood and vegetable fibres having widely varying drying requirements should further attest to the ability of Coe engineers in determining and meeting the particular needs of each type of board.

Two important factors have made this success possible:

First, twenty-eight years of pioneering and leadership in the production of dryers of similar type for costly veneers;

Second, the facilities of the Coe experimental laboratory dryer, available without cost or obligation to anyone interested in board manufacture, for accurately determining the drying needs of boards of any material, from 1/8 to 2 inches in thickness.

Write today for Coe catalog No. 107 giving information on this service.

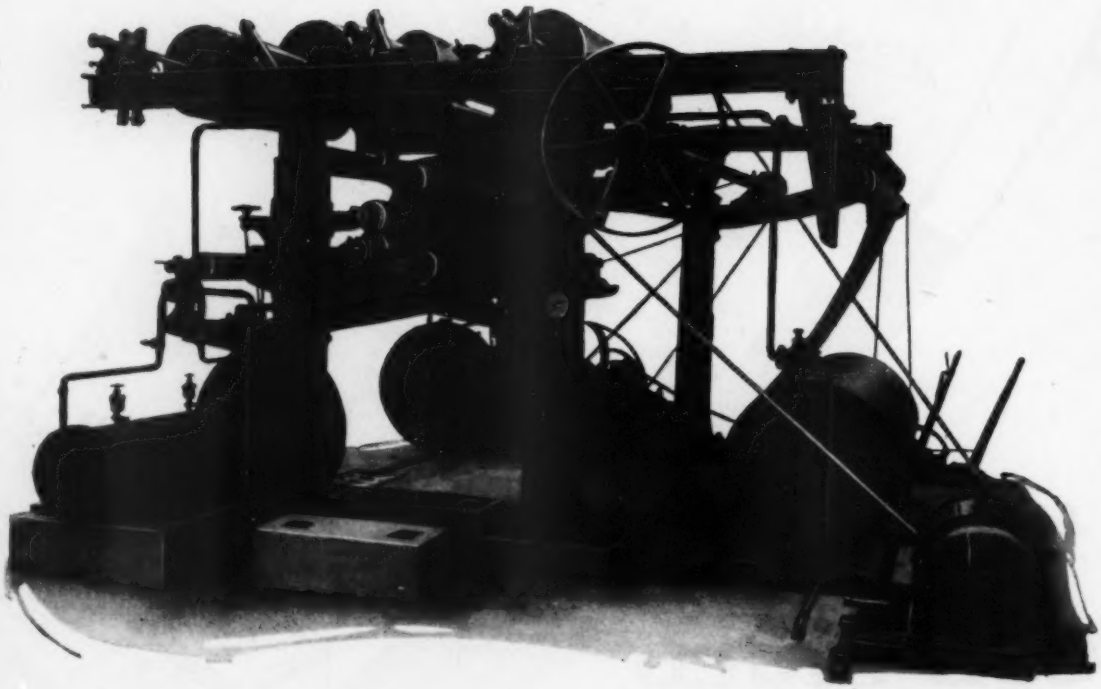
The COE MANUFACTURING CO.
PAINESVILLE—OHIO
382 Bank St.

Send today for this COE Catalog

Name ..... Company ..... Address ..... City ..... State .....

The Paper Industry

A Voith product!



The Bywall-Qvarnstroem

Roll Wrapping Machine

Provides real protection for your rolls at low cost

American Voith Contact Company, Inc.
280 Madison Ave. **New York**

There are two distinct ways of going after paper machine contracts. One way is to get the order. The other way is to get the "business" of every customer—year after year.

We chose the latter way many years ago, when we started. We stick to it; and will. We have been in business here a long time, and will be for a long, long time to come. The work in all its stages and departments, is done by Wilmington men. They like to see business coming steadily to Wilmington, so they all stand back of the Pusey and Jones way.

Our customers like it. Much of our new business traces back to some customer one or two generations ago who liked our way: orders that are modern grandchildren of that early order . . . Might be worth finding out about this.

You might like our way yourself

Pusey and Jones

THE SIGN OF TRADE PARK SUPERIOR QUALITY

THE PUSEY AND JONES CORPORATION, WILMINGTON, DELAWARE, U. S. A., Builders of PAPER MAKING MACHINERY; for NEWS : BOOK : KRAFT : BOARD : : Working For, and in Technical Co-operation With, the Forward-Thinking Minds of the Industry : Since 1848 : The MARK, shown here, will be found on Every Casting, and on every Other Part of major Importance, in every Machine produced by This Company : : It is the Mark of Our Own Technical Standards : : A mark of Superior Quality.

CLACKETY-CLACK!

+ + + Printing *Wealth* + + +

WITH A WHIRR AND A CLATTER the pressroom swings into action. The floor trembles, the lights quiver, the moving maze of steel throbs in the rhythm of its own ponderous dance. A business paper is in the making. Great presses draw in at one end white paper and at the other end pour forth + wealth. For material possessions are not the only wealth of a people. Knowledge is a form of wealth + + knowledge of how to use men and materials and machines to create a wealth greater still. This knowledge + + which economists call fact-wealth, as distinct from material property + + is the wealth which begets wealth.

In the creation of fact-wealth modern business papers play a dominant part. Back of the roaring pressrooms as they pile up fact-wealth in printed form are the news staffs, gathering information at the source, and the editorial staffs, checking and correlating that information. For the business paper's knowledge must be correct + + its readers are experts; they are swift to detect error; they are prompt to appreciate fact. They follow both its reading and its advertising pages intently, for to them the business paper is a very real source of wealth.

As a creator of fact-wealth the modern business paper serves society; it serves its industry or trade; and it serves its individual readers. To this service it owes the honest circulation and the reader interest which make a good advertising medium.

ABP

THIS SYMBOL *identifies an ABP paper . . . It stands for honest, known, paid circulation; straightforward business methods and editorial standards that insure reader interest . . . These are the factors that make a valuable advertising medium.*

THE ASSOCIATED BUSINESS PAPERS, INC.

FIFTY-TWO VANDERBILT AVENUE · NEW YORK CITY

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This publication is a member of the Associated Business Papers, Inc. . . a cooperative, non-profit organization of leading publications in the industrial, professional and merchandising fields, mutually pledged to uphold the highest editorial, journalistic and advertising standards

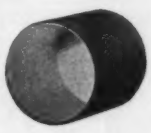
MENASHA QUALITY PAPER PRODUCTS

This box of forty heavily embossed Crest napkins is one of a complete napkin line in striking and colorful packages

The Double XX Pail suitable for ice cream or other foods, a two purpose pail which reduces inventories. Other pails with wire or tape handle, plain and printed —for every purpose

In a sprightly box of orange and brown, with tin cutter edge, Waxtex Household waxed paper is nationally known. Ten and twenty-five cent sizes

Menasha Cans, like the pails, never impart paper tastes or odors. They offer the utmost in protecting their contents—note white lining



A FEW POPULAR Menasha Products are pictured on this page. There are Menasha package napkins which have graduated paper napkins from the lunch counter and put them in the party class. Their appeal to the eye as well as to the practical sense of the housewife gives them a quick turn-over.

With "carry-home service" increasing constantly there is as much pail business as the jobber will go after. Cream-ila board, exclusive with Menasha, makes our pails really sturdier, neater and cleaner.

Waxtex household waxed paper rolls would have as staple a demand as soap if given the attention they deserve. The field is open and waiting for the jobber who will realize the possibilities and the profits with this item that has scores of uses. Waxtex not only gives the utmost in quality and length of roll but the striking box needs only to be displayed to sell itself.

The use of paper cans in modern, sanitary food sale is indispensable. The unique white lining feature of Menasha cans is not only a real sales talk for you but a positive benefit to the consumer—a guarantee of cleanliness.

You'll want more information about these and other Menasha products—so profitable to handle—just send the coupon.

MENASHA PRODUCTS CO.

A DIVISION OF MARATHON PAPER MILLS COMPANY

Marathon Products other than Menasha Products:
Sulphite bonds, food container boards, waxings, M. G. Wrappings, surface marked specialties, conversion papers.

The Menasha Products Company, Date.....
1060 P. Wrigley Bldg., Chicago, Ill.

Gentlemen:

Please send full information about Menasha Products ☐
Marathon Products ☐

(Kinds).....

Firm .....

Address.....

City.....State.....

PAPER MILL MACHINERY

HORNE PATENT BEATERS and HORNE HOLLAND BEATERS—the last word in design and construction. They have been made for years—constantly improved—by specialists in this important paper mill equipment.

Your inquiries will receive prompt and careful attention.

J. H. HORNE & SONS COMPANY

Established 1864

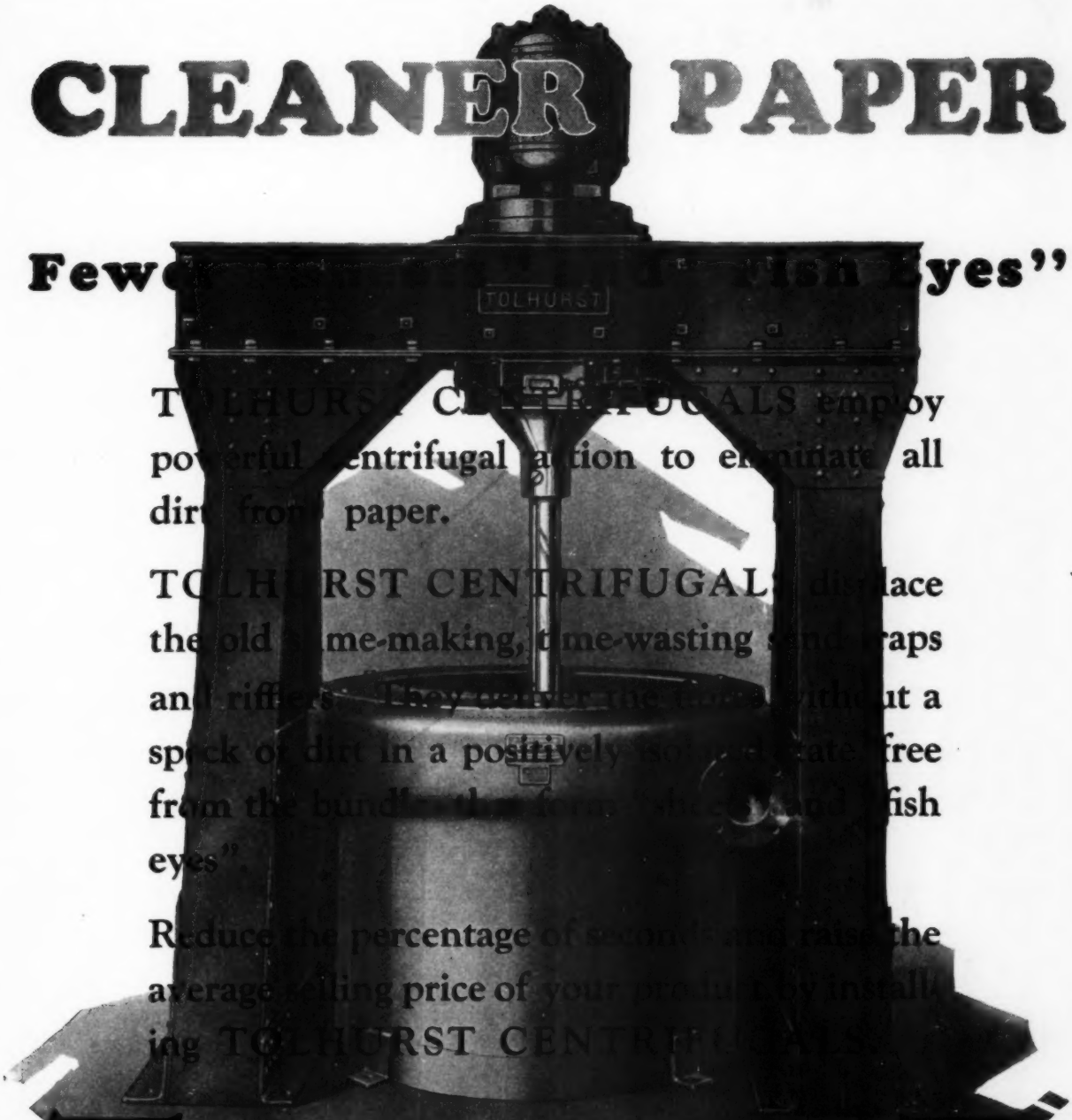
LAWRENCE, MASS., U. S. A.

HORNE

FOURDRINIER PAPER MACHINES — CONVENTIONAL TYPE AND REMOVABLE FOURDRINIERS — CYLINDER PAPER AND BOARD MACHINES — BEATING ENGINES (HORNE patent and HOLLANDER) STANDARD AND HIGH SPEED TYPES — WASHING ENGINES — JORDAN ENGINES, Pulley and Motor driven, equipped with anti-friction bearings, if desired — SINGLE AND DUPLEX PAPER AND BOARD CUTTERS

CLEANER PAPER

Few[illegible] "fish eyes"



T[illegible]LHURST C[illegible]ALS employ powerful centrifugal action to eliminate all dirt from paper.

TOLH[illegible]RST CENTRIFUGALS displace the old time-making, time-wasting screens, traps and riffles. They deliver the finest paper without a speck of dirt in a positively sound state, free from the bundles of [illegible] and "fish eyes".

Reduce the percentage of seconds and raise the average selling price of your product by installing TOLHURST CENTRIFUGALS.

TOLHURST Centrifugals

New York Office: 30 Church St. *Chicago Office: 8 So. Dearborn St.*

TOLHURST MACHINE WORKS, Inc., 654 S. Fulton St., Troy, New York
Gentlemen:— Please send me your new Bulletin on the Tolhurst Centrifugal and list of mills now using it to make *clean* paper.

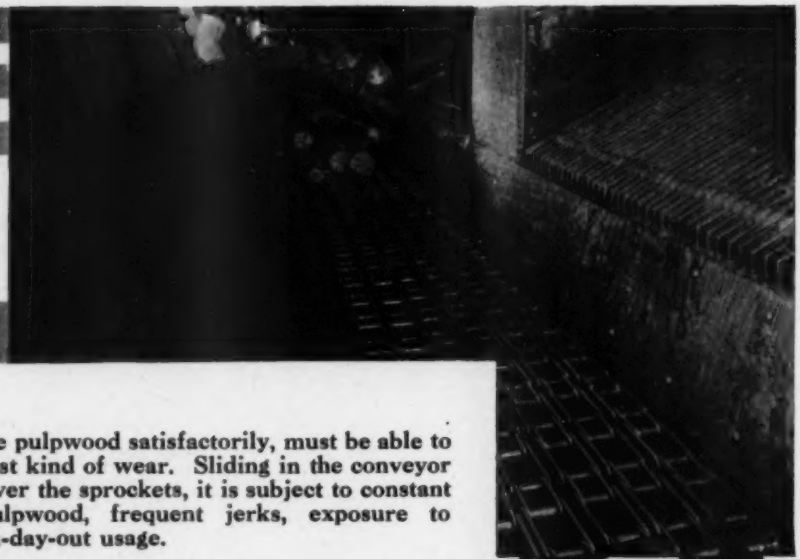
Name..... Position.....

Mill..... Address.....

3783

for conveying PULPWOOD

DEMAND
A CHAIN
THAT LASTS



SIX STRANDS OF JEFFREY HERCULES CHAIN CARRYING PULPWOOD TO CUTTERS

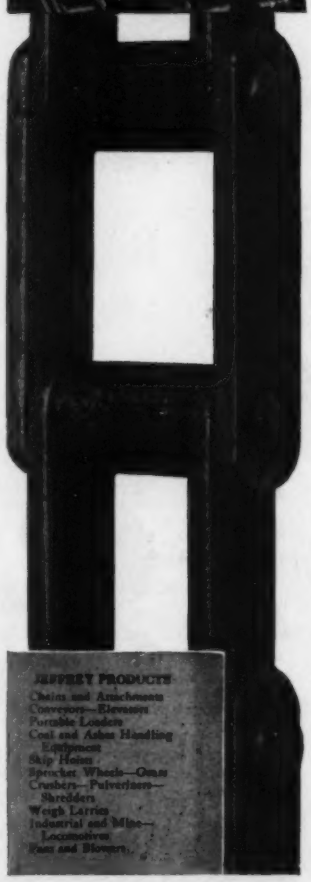
Any chain, to handle pulpwood satisfactorily, must be able to withstand the hardest kind of wear. Sliding in the conveyor trough and riding over the sprockets, it is subject to constant pounding from pulpwood, frequent jerks, exposure to weather, and day-in-day-out usage.

Because it more than fulfills these rigid requirements, Jeffrey Hercules Chain is the most popular chain in the pulp and paper industry for conveying pulpwood. It is also used extensively on bucket elevators and as a drive chain.

The malleable block links of Jeffrey Hercules Chain are made with a hard skin for wear and a tough interior to withstand pounding. Strap links are .40 carbon steel. The barrel of the solid link provides a long pin bearing—extra metal being added where barrel engages sprocket tooth.

D-shank design of the high carbon steel pins provides *full diameter* pins that are locked in the strap link, thus confining all wear to the long block link bearing. Full diameter pins increase the strength of Jeffrey Hercules chains 25% over chains using milled pins.

Chain Catalog No. 480-F gives detailed information about all Jeffrey chain and attachments. Free on request.



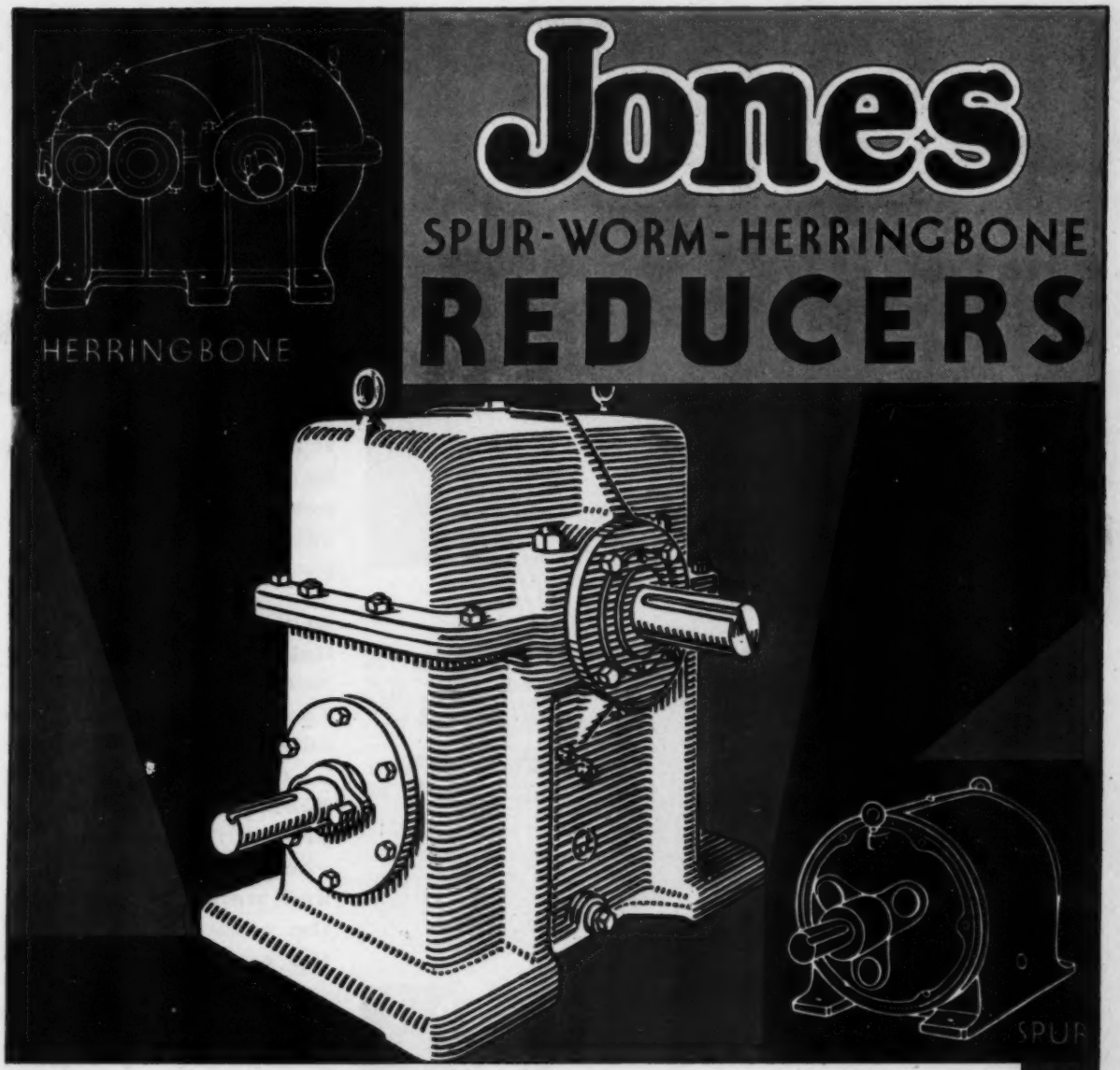
The Jeffrey Manufacturing Company

944-99 North Fourth St., Columbus, Ohio

New York	Pittsburgh	Detroit	Salt Lake City
Buffalo	Boston	Chicago	Birmingham
Rochester, N. Y.	Scranton, Pa.	Charleston, W. Va.	Houston
Utica	Philadelphia	Cincinnati	Denver
Cleveland	St. Louis	Milwaukee	

Jeffrey Manufacturing Co., Ltd. of Canada. Head Office and Works, Montreal; Branch Office, Toronto

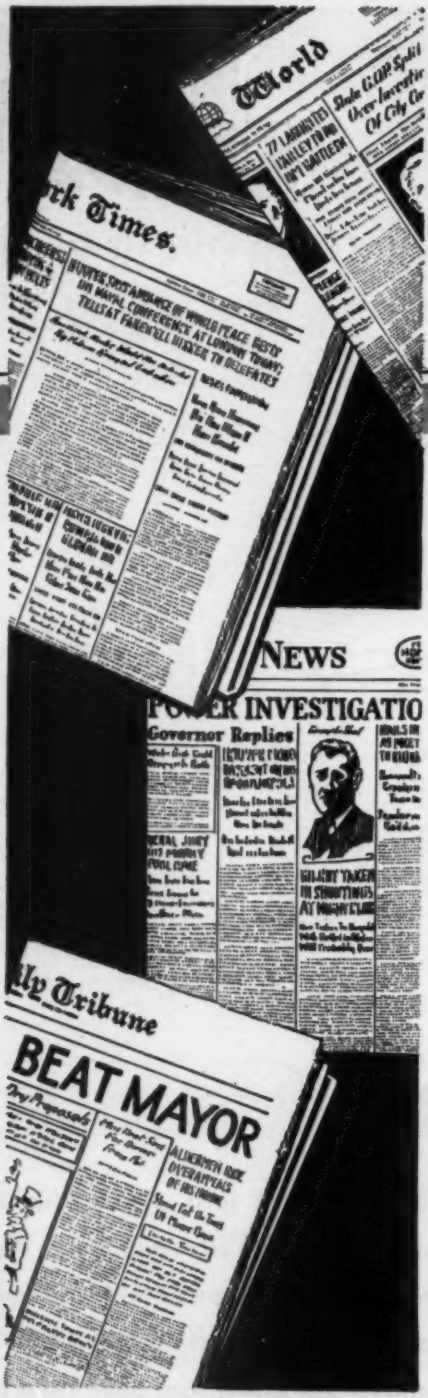
JEFFREY
MATERIAL HANDLING EQUIPMENT



THERE ARE SPEED REDUCTION jobs where only a right angle drive will fill the bill. Under such circumstances, the Jones Worm Gear Speed Reducer, shown above, will deliver the maximum of power at the minimum of cost and upkeep. There are no favorites in our family—we know that each type of reducer we make—spur, worm, herringbone—has its special application and its special merits. All are alike in the quality we build into them. Quick service from a large stock of standard ratios. Let's talk over your speed reducer requirements on the basis of selecting the machine best suited for your particular speed reduction job.

W. A. JONES FOUNDRY & MACHINE CO., 4401-4451 W. Roosevelt Road, Chicago, Illinois

The NEW KENWOOD TANNED NEWS FELT IS A PROVED ECONOMY



It has fully demonstrated its worth and justified the progressive, scientific development that made it possible.

In openness, strength and finish, this new Kenwood News Felt is outstanding. To these advantages are added the benefits of the patented Kenwood Tanning processes which protect the felt from the effects of acids, alkalies and water and enhance the natural resiliency of the wool.

Kenwood pioneered the one-sided board felt—Kenwood developed and perfected the Kenwood Tanning Processes. In the new Kenwood News Felts a further major development to the economy of papermaking is brought forth.

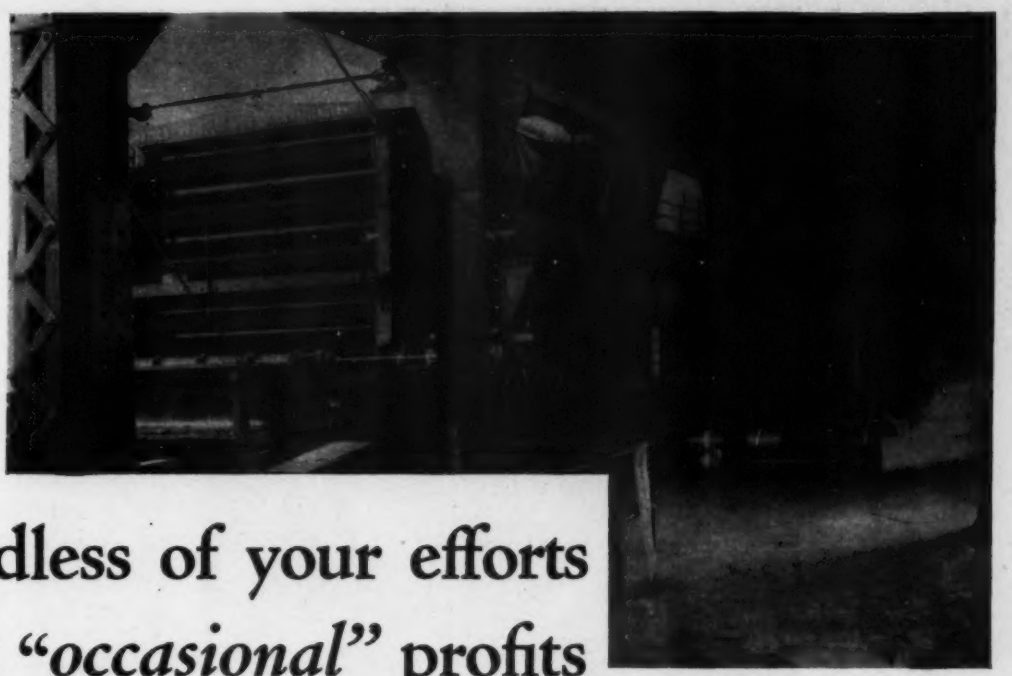
KENWOOD WOOL PRODUCTS

F. C. HUYCK & SONS

KENWOOD MILLS, ALBANY, N. Y.

KENWOOD MILLS LTD., ARNPRIOR, ONTARIO, CANADA

KENWOOD FELTS



Harland Drive on paper machine in the plant of the Oji Paper Company, Japan.

Regardless of your efforts —only "*occasional*" profits can result from "*occasional*" performance

MAXIMUM profits cannot result from "occasional" performance. Paper machines to be consistently profitable must deliver high production day after day, year after year . . . and *without* "nursing."

The Cutler-Hammer (Harland) Sectional Drive for Paper Machines assures that kind of performance. Its design and construction are so simple that it goes into action at once . . . usually producing tons of salable paper the first day stock is put on the wire. It is easily understood and mastered by your mill-maintenance man, it is unique in the trouble-free performance it delivers—"it seems like heaven" according to one superintendent after his first experience with the Cutler-Hammer Drive.

Job machines equipped with Cutler-Hammer Drive attain a new flexibility and ease in changing speeds and weights. Newsprint machines equipped with it have repeatedly set world's tonnage records. Synchronization of sections is so perfect that 50-hour runs without a break are commonplace.

Increased production, reduced power consumption; lower operating costs . . . and of course, absolute flexibility and control, are factors which warrant your thorough investigation of the Cutler-Hammer Drive. Send for the booklet, "*Keeping Paper on the Reel.*"

CUTLER-HAMMER, Inc.
Pioneer Manufacturers of Electric Control Apparatus
1271 St. Paul Avenue
MILWAUKEE, WISCONSIN

CUTLER HAMMER

Harland Electrically Interlocked Paper Machine Drive

(A 252)

Pulverized Fuel Systems for Paper Mills

Compactness—reliability—efficiency—are outstanding characteristics of the Aero unit system for firing pulverized fuel, illustrated in the above photograph.

The accessible arrangement of the boiler room equipment as well as the Aero pulverizers, is noteworthy. Heavy steel construction of the Aero mills, with all pulverizing surfaces of manganese steel, is responsible for the years of satisfactory operation that Aero machines are showing in daily service.

Each of the three steam generators at this paper mill include a 500 hp. boiler, Foster economizers, Foster radiant superheaters and Foster water cooled side walls. The overall efficiency exceeds 84 per cent.

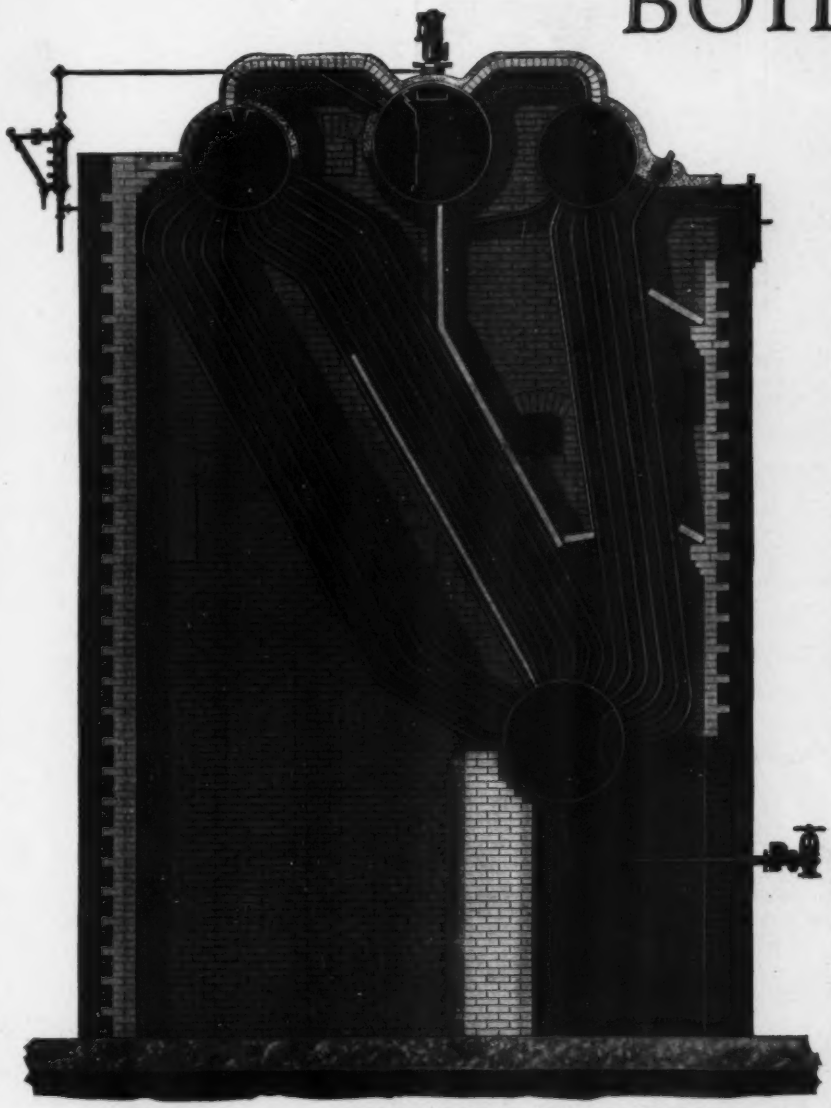
FOSTER WHEELER CORPORATION
165 Broadway, New York, N. Y.
Branches in Principal Cities

Foreign Associates—Foster Wheeler Limited; London, England
Société Anonyme Foster Wheeler; Paris, France
Foster Wheeler Limited; Toronto—Montreal, Canada

FOSTER WHEELER

Introducing the

4-DRUM EDGE MOOR BENT TUBE BOILER....



The Edge Moor Four-Drum Bent Tube Boiler embodies the most modern engineering developments in this type of steam generator.

It is available in units containing up to 20,000 square feet of heating surface, for any desired working pressure.

In every factor important to power plant operation and management, this new boiler meets the exacting demands of present-day practice.

Its performance is guaranteed by an organization with a half-century of successful experience in boiler building.

A booklet describing its design and construction will be sent at your request.

EDGE MOOR IRON COMPANY *Established 1868* EDGE MOOR, DELAWARE

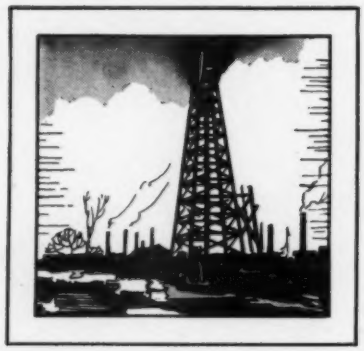
New York Chicago St. Paul Charlotte Los Angeles

EDGE MOOR BOILERS EDGE MOOR, DEL. U.S.A.

EDGE MOOR Water Tube BOILERS

STRAIGHT AND BENT TUBE TYPES—WATER WALLS—AIR PREHEATERS

. . She Gushes! . . Oil!



THAT cry, which has since made a thousand millionaires, was heard for the first time in August 1859 when "wildcatters" brought in the first oil well in the United States at Titusville, Pa.

It was a little more than a year before this time that Asa Shuler and J. W. Benninghofen formed a partnership to manufacture paper making felts.

This partnership still exists among the descendants of these two men and they are making felts which embody the experience gained in these seventy years and three generations of experience. Naturally Hamilton Felts are better felts. It would be strange indeed if they were not.

It is this experience that dictates the entire process of making these felts which combine strength with great water removing qualities; that save in steam and coal costs; that wear longer and produce better paper with less down time for washing; that make money for the wise manufacturer who uses them.

But the test of a Hamilton Felt is in your mill on your machines. For purposes of comparison take your hardest one—put on it a Hamilton Felt, and give it the hardest test of use and performance you think a felt ought to have. Don't spare it. You'll come back and want these better felts on all your equipment.

Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them

Ask the Hamilton Felt man who is a practical paper maker as well as a felt expert the next time he calls. Tell him your problem. He'll have a felt for you that will meet it exactly. Most likely he calls on you regularly, or you can write to us direct.

Shuler and Benninghofen, Hamilton, Ohio

The Miami Woolen Mills

ESTABLISHED 1858

Hamilton Felts

A RECORD SELDOM

IN THE VANGUARD OF PROGRESS

B·C PRESS ROLL SECTIONS

B·C SPIRAL BEVEL GEAR DRIVE

B·C VERTICAL DRYERS

CHAMPION FOURDRINIER

BLACK-CLAWSON

The Black-Clawson Co., Hamilton, Ohio

A RECORD SELDOM EQUALLED IN ANY INDUSTRY

There are in operation more Shartle Breakers in the United States, Canada and foreign countries than all other builders can account for.

And more significant still is the fact that no other breaker has ever permanently displaced a Shartle, while Shartle Breakers have replaced one or more of every other make.

A record seldom equalled in any industry and a "Weather vane" for buyers of beating equipment.

SHARTLE BROS. MACHINE CO.
MIDDLETOWN, OHIO
Div. The Black-Clawson Co., Hamilton, Ohio

Export Office, 15 PARK ROW, NEW YORK, N. Y.

SHARTLE BREAKERS

"So you *did* match that shade!"

FOR matching current colors on light boxboards and container boards, turn to du Pont and Du Pont Dyestuffs.

Du Pont Metanil Yellow Conc. produces all yellow and brown shades when used alone or in combination with Du Pont Orange RO, Du Pont Orange II Conc., and Du Pont Nigrosine WSB Powder. Its high tinctorial power makes it very economical for calendar coloring.

Other Du Pont Dyestuffs extend the color range to meet every need for boxboard coloring. They all possess excellent solubility. Let one of our men call to tell you more about the dyestuffs especially developed for paper mill needs, and the du Pont technical service which is available to you.

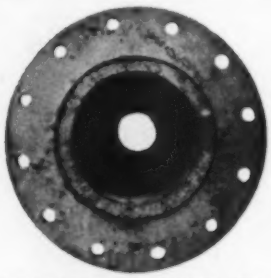
Du Pont Metanil Yellow Conc.
Du Pont Orange RO
Du Pont Orange II Conc.
Du Pont Aruamine Conc.
Du Pont Chrysoidine GN
Du Pont Methyl Violet NE
Du Pont Victoria Green, small crystals
Du Pont Methylene Blue ZX
Du Pont Safranine T Extra
Pontacyl Fast Red AS
Du Pont Nigrosines WSB Powder and WSJ Powder

DU PONT DYESTUFFS
REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & COMPANY, INCORPORATED, DYESTUFFS DEPARTMENT, WILMINGTON, DELAWARE

MICHIGAN PIPE COMPANY

MANUFACTURERS OF
COMBINATION STEEL AND WOOD PIPE
Office and Factory: Bay City, Michigan



Pat. Applied For

SPECIAL COLLAR FLANGE FOR PAPER MILLS

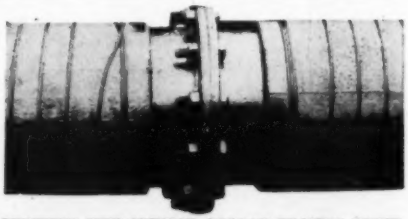
Note: Standard Bolt Circle. Liquid conveyed does not come in contact with metal.

PRODUCTS:

Standard Collar Flanged Wood Pipe for Paper Mills

Pipe for conveying—
- Pure Water
- Acid Water
- White Water
- Sulphite Waste Water
- Paper Stock, bleached or unbleached
- Ground Wood Pulp
- Gases

Special Fittings for Acid Work.

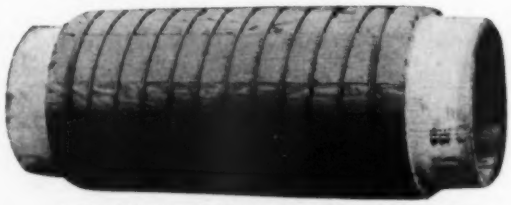


SHOWING THE SPECIAL COLLAR FLANGE JOINT, LIGHT IN WEIGHT. SPECIALLY DESIGNED FOR INSIDE INSTALLATIONS. EASY TO TAKE APART

WRITE FOR CATALOG

ADVANTAGES:

Saves Power
No Discoloration
Lasting Qualities
Light in weight
Cheaper
No Scale or Rust
Easy to Install
Acid Resisting
Neat Appearance



"MICHIGAN" SPECIAL PAPER MILL WOOD PIPE

EASY TO ORDER:

Just advise your lengths face to face of flanges.

Exact lengths furnished for each line.

OVER ONE HUNDRED PAPER MILLS ARE USING STANDARD COLLAR FLANGED WOOD PIPE

STANDARD COLLAR FLANGED WOOD PIPE RECENTLY INSTALLED IN THE PLANT OF THE OXFORD MIAMI PAPER COMPANY, WEST CARROLLTON, OHIO

Nearly 100% of the Linings Used in the Paper Industry are 'Stebbins'

Naturally... **because 47 years of satisfaction-packed results have identified "Stebbins" with the sort of linings that keep right on giving satisfaction. Stebbins has built up the only complete organization in the industry solely devoted to the manufacture and installation of linings. An organization of *lining specialists* who supervise every detail from the analysis of the requirements of the job through the careful selection of materials, the hand moulding and precise firing, the efficient time-conserving routing of both materials and construction crews, the actual installation, to the inspections and service that are component parts of the Stebbins guarantee. Stebbins service is constantly at YOUR service . . .**

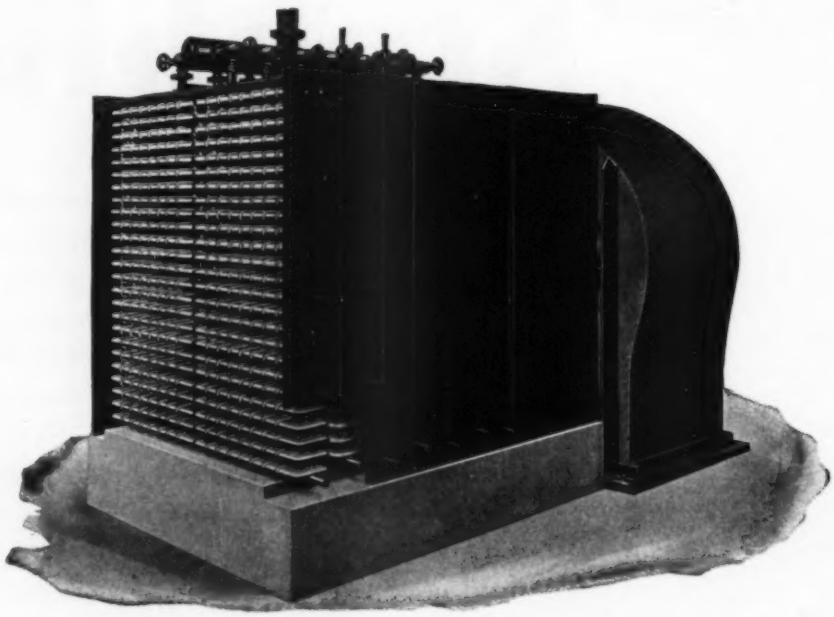
A Half Century of Making and Installing Vitreous and Refractory Brick and Tile Linings for

Acid Recovery Tanks	Caustic Liquor Tanks	Settling Tanks
Acid Storage Tanks	Combustion Chambers	Soda Digesters
Acid Towers	Conveyors	Stock Chests
Autoclaves	Diffusers	Sulphate Digesters
Beaters	Incinerators	Sulphite Digesters
Bleachers	Leaching Tanks	Sumps
Blow Pits	Separators	Vomit Stacks

If it's a Lining Job ...Call on

Stebbins Engineering & Mfg. Co.
Watertown, N. Y.
Pacific Coast Office, **Seattle, Wash.**

Stickle Blast Coil Heater or Economizer Will Dry Your Felts With Hot Air



STICKLE air cooled condenser maintains a vacuum of 10 to 15 inches on the return line of your paper machine, returns condensate to the boiler room as hot as it can be handled with a pump without the admission of cooling water. Will heat 1000 cubic feet of air per minute for every ton of paper dried per day, furnishing hot air in the pit to dry the felts and absorb the vapor under the dryers, making a direct saving of at least 15 per cent in steam consumed for drying the paper and ventilating the machine room. This can be done at a moderate cost. Are you interested? Complete plans furnished without charge.

Stickle Steam Specialties Co.
INDIANAPOLIS, IND.

AUTOMATIC STEAM CONTROLS
BLOWING THROUGH DRAINAGE SYSTEMS
COMPLETE LINE STEAM SPECIALTIES

Coal from Water

GEOLOGY teaches us that coal is derived from ancient vegetation, but modern science has gone nature one better, for in your own plant today you can obtain coal, and lots of it too, from water.

There is no mystery about it.

Your boilers evaporate approximately four gallons of water per boiler horsepower per hour. If you have 75% condensate that can be recovered for boiler feed, it would amount to 72,000 gallons per day of 24 hours for 1,000 B.H.P.

With a temperature difference of 130° F. between condensate and makeup water, this 72,000 gallons would contain 77,700,000 B.t.u. of heat in excess of the makeup water, which is equivalent to 8540 lbs. of coal burned at 70% boiler efficiency, based on 13,000 B.t.u. fuel.

When there is oil in your condensate, it cannot be used in your boilers, so it is discharged to waste, and with it goes 8540 lbs. of coal for every 1,000 horsepower developed in your plant per day.

Permutit Oil Removing Filters will remove from water all oil, either in suspension or emulsion. They make available for boiler feed the hot condensate that would otherwise be wasted—they practically turn that water into coal.

It will pay you to look into this subject further. Write for our free booket, "Saving Fuel and Repairs with Oil Free Feed Water."

No obligations—write today.

Permutit Oil Removing Apparatus occupies but little space and is easy to maintain.

The Permutit Company

APPARATUS FOR REMOVING IMPURITIES FROM WATER

MAIN OFFICE: 440 FOURTH AVENUE, NEW YORK — BRANCH OFFICES IN ALL PRINCIPAL CITIES

Paulson Barking Drum

This Company has been actuated by one undeviating incentive in designing and building Paper Mill Equipment: To design and build as finely as can be done; to spare no time—no care; to eliminate the element of chance from even the smallest part; to know that Manitowoc Paper Mill Equipment is as nearly perfect as is humanly possible.

Write for full information.

Designers and builders of —

Barking Drums	Incinerators
Sulphite Digesters	Disc Evaporators
Experimental Digesters	Air Nozzles
Globe Rotary Digesters	Diffuser Tanks and Swing Pipes
Cylindrical Digesters	Bleach and Clay Mixers
Rotary Lime Kilns	Rod Mills

Moore Crawler Speedcranes, Shovels, Draglines and Trenchoes

MANITOWOC ENGINEERING WORKS

Manitowoc, Wisconsin

THEY COME TO E-M ENGINEERS *for* NEW APPLICATIONS *of Synchronous Motors*

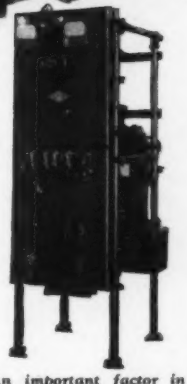
Two 200 h.p., 900 r.p.m. E-M Synchronous Motors connected to Marcy open end rod mills in paper making plant. Mills are of 50 tons daily capacity each.

AMONG the paper manufacturers adopting Marcy Rod Mills for beating and hydrating pulp, is the concern* whose installation is shown here. These two Marcy Mills are among the largest ever used in this service.

The management of the plant wanted the benefit of synchronous motor reliability, constant speed and efficiency for driving these mills. But it was a new venture . . . a departure from custom, this use of rod mills in the paper making industry.

So they came to E-M . . . to be sure the motors would exactly meet requirements. The E-M Motors shown above were the result.

Like all other E-M Motors, these were specially engineered for the job. They were designed for the high starting and pull-in torques required; and for .80 leading power factor to correct the power factor in the plant. They are automatically controlled by E-M Full Voltage Starters.



An important factor in the smooth performance of E-M Motors is the E-M Automatic Starter. Synchronization is accomplished in the shortest possible time and with a minimum of current inrush and line disturbance. The essential element, the E-M field responsive control, is fully patented and constitutes an exclusive feature of the E-M equipment.

The high degrees of reliability and economy assured by E-M Synchronous Motors are well established by many and varied installations throughout the paper making industry. If you have a drive problem, it will pay you to learn more about them. Write for a copy of "*The Most Efficient Drive in Industry.*" And if you desire expert counsel on a specific matter involving machine drive, there is a qualified E-M Engineer located in or near your city, who will be pleased to call at your office.

Electric Machinery Mfg. Company
Specialists in Apparatus for Power Factor Improvement
1341 Tyler St., N. E., Minneapolis, Minn.
Sales Offices in Principal Cities

* Name on request

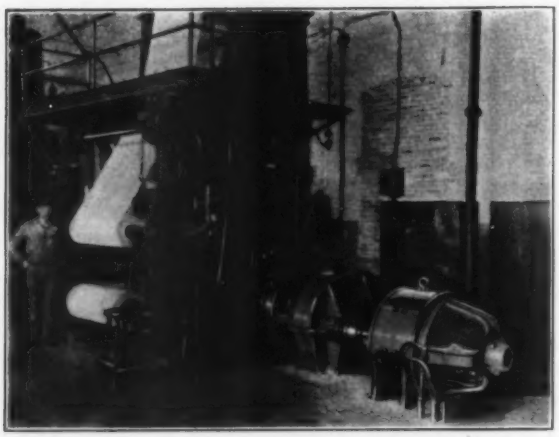
Users of E-M equipment are assured of quick, reliable service by a corps of trained engineers working out of E-M offices in 40 cities. The specialized, quick-moving E-M factory and sales organization is always ready to give prompt, skilled attention.

EM *Synchronous* **MOTORS**

THE DEPENDABLE, ECONOMICAL DRIVE FOR PULP AND PAPER MILLS

(A-88)

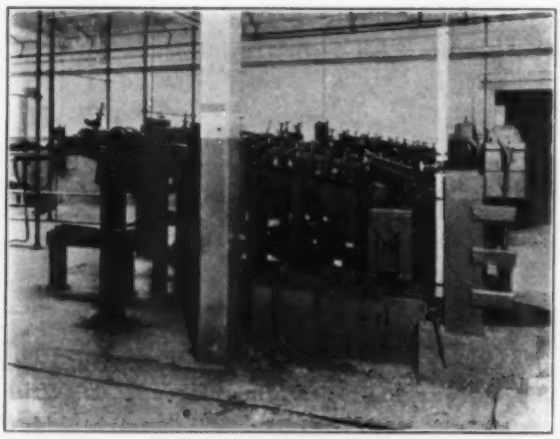
Simplify Driving Parts, this way



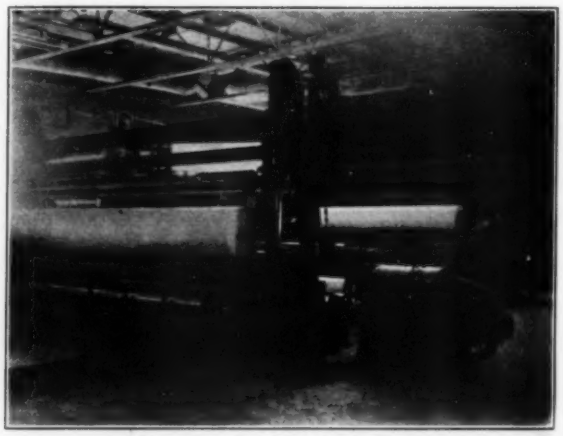
This shows the simplicity of super-calender drives as developed at the plant of the Rhinelander Paper Co. The speed of the 75 hp. Reliance Motor is changed by variable-voltage control to give paper speeds of 50 to 450 f.p.m.

The adjustable-speed motor serves a double purpose. It supplies power and provides within itself a simple and efficient method of speed changing. It enables you to get power closer to the place it is to be used with fewer belts, pulleys, gearing and clutches. The elimination of intermediate driving parts saves space and reduces maintenance.

Reliance Engineers have aided in the development of motor-drives which have brought increased production and lower costs on many kinds of paper mill work. Why not make use of this experience which is available for solving similar problems in your mills.



A coating machine at Champion Coated Paper Co. driven by 3 hp. 850-1700 r.p.m. Type T Reliance Motor. The brushes and color mixer are each operated by 2 hp. 1150 r.p.m. Type AA Reliance Induction Motors.



10/35 hp. 168-670 r.p.m. Type T Heavy-duty Reliance Motor driving Cameron Winder for 202" book paper machine at Fraser Paper Ltd. Compare this positive direct drive with the usual combination of belts and clutches. Power is applied where it is wanted and controlled with safety.

RELIANCE ELECTRIC & ENGINEERING CO., 1058 Ivanhoe Road Cleveland, Ohio

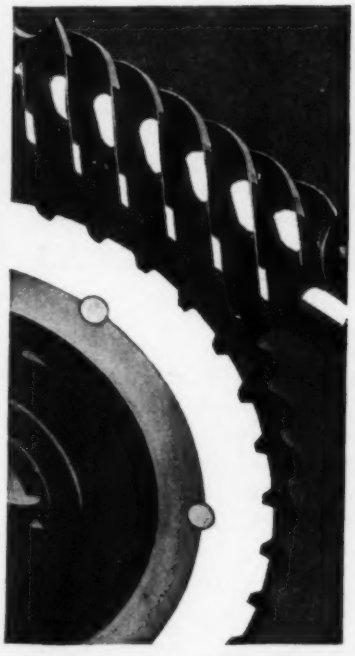
Branches: Birmingham, Boston, Buffalo, Chicago, Cincinnati, Detroit, New York, Philadelphia, Pittsburgh, St. Louis, Toledo.

Representatives: Denver, Kansas City, Knoxville, Los Angeles, San Francisco, Seattle.

RELIANCE A-C D-C MOTORS

Cleveland Type RT Unit driving dryer section of paper machine. Ratio 4⅘: 1, 8½ h. p., 400 r. p. m.

The first consideration in a speed reducer



TRANSMISSION of power to production machines is far too vital an operation to trust to any but the most dependable of speed reduction drives. That is why unfailing performance IS and will ALWAYS be the first thing to consider in choosing a speed reducer.

How can you be sure of unfailing performance? Look first for strength . . . . strength not only to resist ordinary strains, but sudden shock overloads. Look for simplicity . . . remembering that complicated arrangements of gears mean greater opportunity for trouble and wear. Look for precise machining . . . for the best of bearings . . . and for accurate alignment of gearing.

You will find them all in Cleveland Worm Gear Speed Reducers. Strength to resist shock overloads 2½ times the rated capacity. Simplicity of design that requires only a single worm and gear for ratios up to 100 to 1. Machining of an accuracy seldom attempted on any kind of equipment. Combined radial and thrust bearings on the worm shaft. Timken heavy tapered roller bearings on the gear shaft. Worm and gear aligned to 1/1000th of an inch accuracy.

These are the features which, together with many others, have earned for Cleveland Units the widespread reputation of the most dependable speed reducers it is possible to produce at any price.

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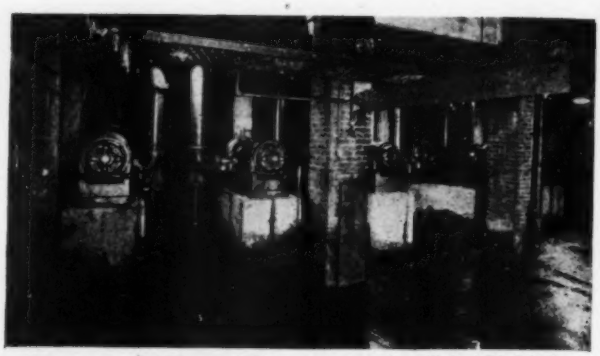
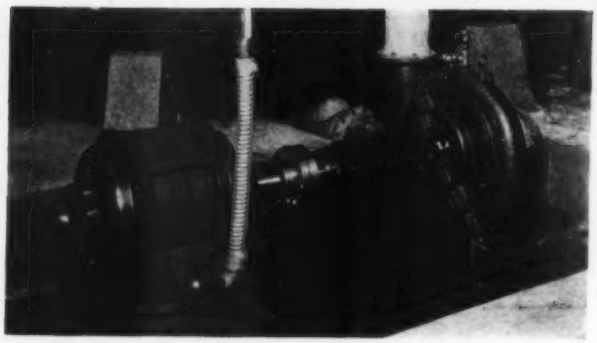
Warren Pumps for paper mills



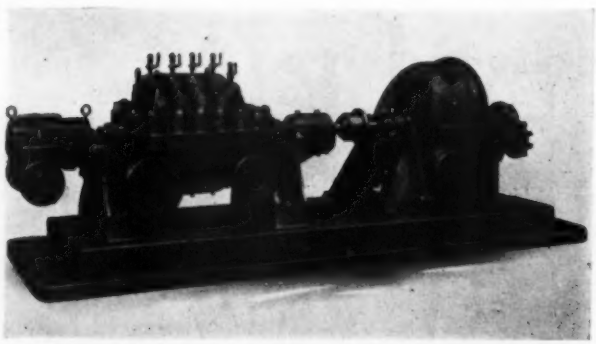
5 of a group of 8 Warren white water pumps installed at Bird & Sons,



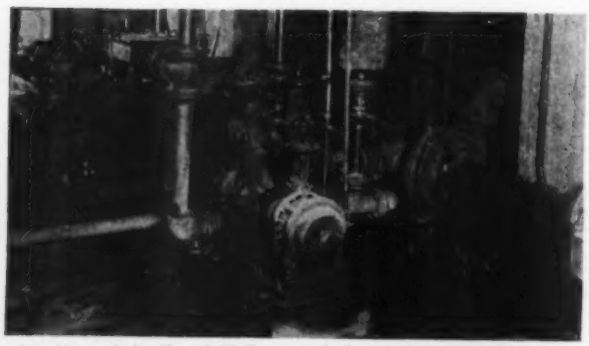
This Warren stuff pump in an eastern mill fills a 1400 lb. beater with 5% stock in 1 minute 20 seconds.

69% repeat orders from pulp and paper mills in 6 years . . . proof that Warren Pumps are built to live up to the claims made for them.

Warren stuff pumps will move 6% clean stock smoothly, efficiently and without clogging.



A Warren 4" five stage centrifugal boiler feed pump for feeding boilers against 500 lbs. working water pressure. Installed at Southern Advance Bag and Paper Co.



A battery of six 4" and 5" liquor and clear water pumps in a new southern paper mill.

A Warren quotation is a guarantee that the pumps will do the work claimed, to the customer's satisfaction . . . Warren pumps are designed and built by engineers thoroughly familiar with pulp and paper mill conditions. Bulletins or estimates?

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Steam Pump Company Inc. WARREN **Warren Massachusetts**

Agencies in all principal cities.

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A three unit installation of Norwood Steel Pressure Filters

Will your plant be prepared when Spring comes—with its freshets and high water filled with dirt and debris? Will your plant continue production on an even schedule or will you have partial shut-downs due to unusable water? High water, low water and dirty water periods hold no worries for the mills equipped with Norwood Filters, for they know that all dirt, leaves and other foreign matter will be perfectly filtered out. Only clean water enters into the making of the paper, resulting in uniform quality. Machines are not plugged or damaged—continuous operation is possible. Norwood Water Filters have many advantages and exclusive features. Investigate them now!

You can't go wrong with an installation of Norwood Filters, Calenders, Platers, Dusters, Rag Thrashers, Folding Machines, Suction Boxes or other equipment.

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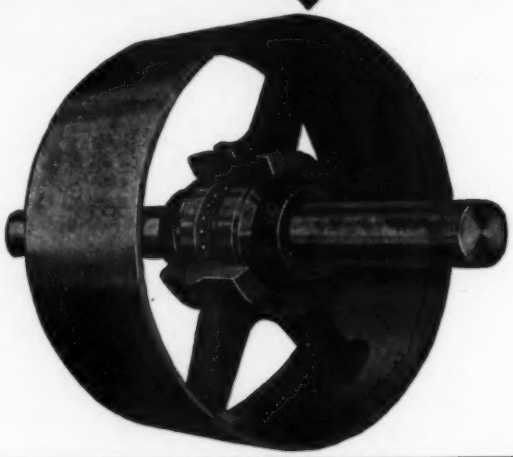
AGAINST
LEAK
DUST
WEAR
TROUBLE

"Our loose pulley troubles have been entirely eliminated since we replaced our old ones with WOOD'S BALL BEARING LOOSE PULLEYS. They are easy to install—anyone can do it; do not wear out in bore, nor score the shaft; need lubrication only two or three times a year; grease can't leak out and dust can't get in; they're saving us money and worry every day." Would it mean anything to you to avoid any or all of these loose pulley troubles? Sure it would, and you can avoid them by using

WOOD'S BALL BEARING
LOOSE PULLEYS

BALL BEARING LOOSE PULLEYS



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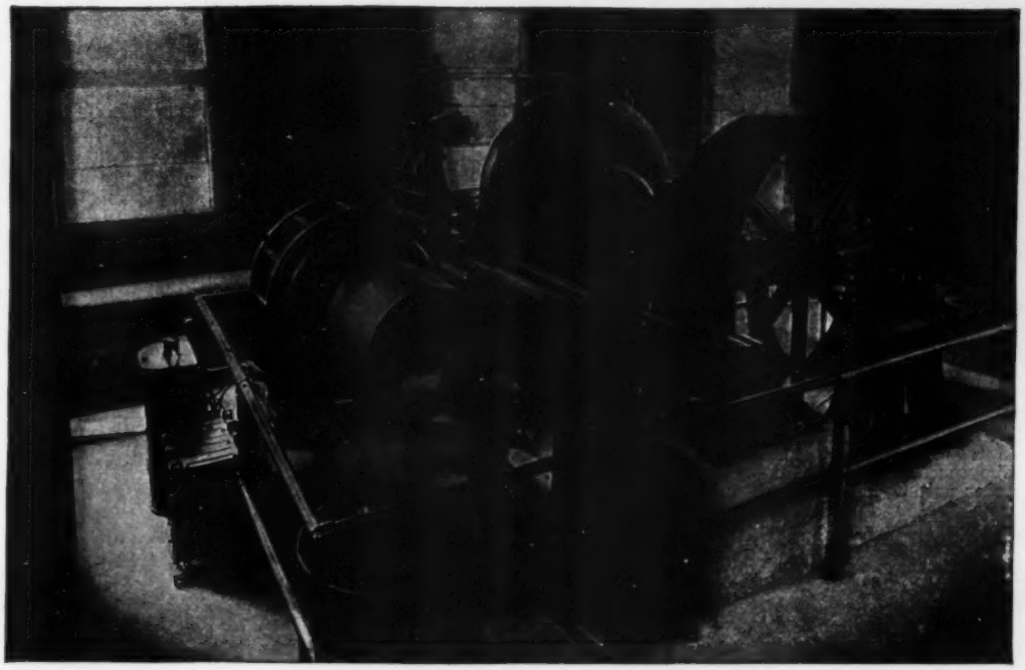

An example of a high-speed, LENIX Equipped, pump drive. Motor rating 200 H.P. Speed of belt 6000 F.P.M.

No Belt Is Abused When LENIX Equipped

. . . on the contrary, every belt is protected

THERE'S a certain minimum tension under which a transmission belt will function to its full efficiency yet be under no undue stress.

Anything under this minimum tension means lack of power transmitting capacity. Anything over it means abuse for the belt.

And too often is excessive tightening resorted to in order to keep up capacity.

The LENIX protects the belt from this abuse by providing the greatest arc of belt-pulley contact with minimum belt tension. The gripping action is there but belt abuse is avoided.

The price of the LENIX is small compared to the price paid for abused transmission belting. Why not protect your belt by installing a LENIX Short Center Belt Drive?

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DE LAVAL
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State your special pumping requirements and ask for Catalog B.
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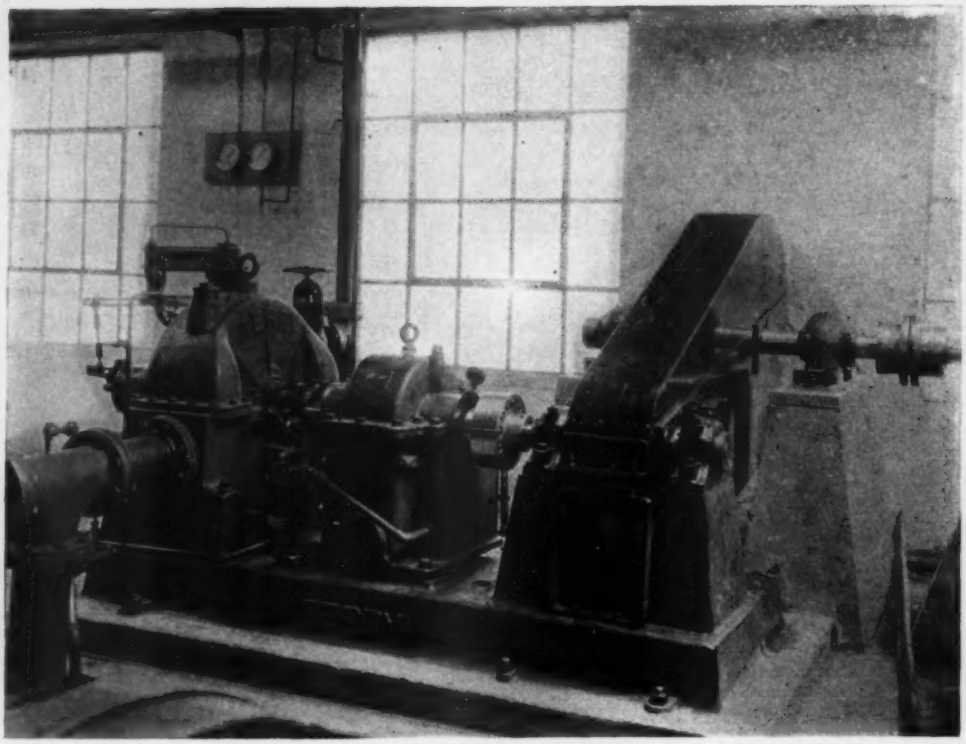

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Replaces a reciprocating engine

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THE PAPER INDUSTRY

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Vol. 11 MARCH, 1930 No. 12

The International Situation in Paper

By KING HAMILTON GRAYSON
Consulting Research Engineer

This is a continuation of the phases of marketing paper in world markets, and of the competition existing or anticipated, as started in the first article of this series, published in the December issue of The Paper Industry. The author made a personal investigation of export and import conditions in various countries.

WHEN American and Canadian paper manufacturers arrange for the appointment of exclusive representatives in foreign countries, they should include such supervision of those representatives as is necessary to protect and promote their interests. Many manufacturers have arranged for qualified special representatives on foreign importer's staffs in each important office. Such arrangements vary considerably, but the plan is always effective. It overcomes many difficulties, providing the man selected is sufficiently polished to coincide with foreign customs. As an alternative, a district sales manager may supervise a number of offices. Such experts must be given very free hands, and must be qualified to use their own initiative as time forbids delays incident to correspondence.

If a man is sent abroad, extreme care should be exercised in making the selection. Properly educated and trained men can accomplish wonders, especially if the type to win foreign confidences. Poor selections are extremely expensive, not only because of the way they spend money, but in the effect upon the company's reputation. Such men must have a fine sense of the better things in life. Paper manufacturers should not entrust their interests abroad to persons without character; this is even more important than with representatives at home, for greater responsibilities rest on those who serve them abroad. Many American firms make the mistake of sending "rough and ready" types of salesmen to foreign countries. These men often get initial orders, but the business usually ends there.

In foreign countries special representatives occupy positions of real importance, corresponding to that of branch-office managers at home, except with greater responsibilities and powers. They are in competition with the whole world, and in truth, are "Business Ambassadors"—they usually sell more than a dozen salesmen at home.

There are many trade centers where the stationing of special representatives has an opposite effect from good. In such centers, foreign representatives are the only alternative. However, comparisons and experiences have proven that it is somewhat dangerous to grant exclusive sales agencies. Foreigners seldom appreciate the quality of American-made papers to represent them properly. Not adequately understanding American ideas of standardization of method or products, foreign sales and advertising methods are invariably different, which makes it difficult to link together the home and foreign offices. This condition, naturally, applies with more forceful effect in all of the English-speaking countries.

In those world corners unfamiliar with English, good results are usually secured through foreign representatives. As one might suppose, this is due to the difficulty of finding Americans who are efficiently familiar with foreign languages and customs. In Siam, a Siamese firm has positive advantages to offer to buyers of their nationality. In Brazil, the Brazilians have a similar status. But with such exceptional circumstances it is often difficult to Americanize sales aggressiveness, and it is more often good wisdom to induce foreign representatives to employ one or more good American salesmen who have been properly trained by some paper manufacturer in the States or Canada.

When an American paper manufacturer selects a man to send abroad, he should give preference to a

sales engineer with a good commercial instinct. Such a man must have moral qualifications which will surmount vast numbers of temptations; one whose social abilities will make him acceptable in any foreign country. Consequently, he should have characteristics greatly superior to those of the ordinary type of salesman. Such a man's standard of living will be much higher; and if he has children, their education and needs must also be considered—usually expensive, if they are to be returned to the States for training.

Paper manufacturers must, therefore, view such a man with a different commercial sympathy than that accorded the domestic salesman, and they must offer him some special inducement to go and remain abroad. Such paper salesmen will not remain in many foreign cities for long unless they are setting aside a substantial saving each year. If paper manufacturers are inclined to be too penurious with salary and expense money, that type of sales engineer will soon take on "side lines" to increase his income, and thereby decrease his efforts for the manufacturer supposedly represented exclusively. The paper manufacturer who sends exclusive representatives to foreign countries must be prepared to be liberal or such sales engineers' "exclusiveness" will soon end.

First Hand Information

American paper manufacturers who are seeking world markets for their products are naturally interested in knowing what competition exists. While there are many bureaus whose service is available to all American manufacturers, special representatives, regardless of their particular line of products, are invariably one of the most reliable sources of information. This is due to the mode of living in many foreign cities. Sales engineers invariably collect at some exclusive club or rendezvous where they can gather with others from their own country, and during these meetings an exchange of ideas, trade information and potential orders takes place. The alert special representative for a paper manufacturer can gain a vast amount of valuable information by attending those clubs, but this expense is often seemingly out of proper proportion to the orders gained at that time. If such information is properly recorded for later use, its value becomes apparent and the expense of securing it can easily be forgotten.

In viewing the field of competition for the American paper manufacturer it is necessary to take into consideration a few prime facts. In Poland, for instance, paper production is the second most vital element in industry; in Lithuania, pulp is the third most important; in Estonia, paper is the second most important; and in Finland, paper and pulp production mean almost everything to the people. Viewed in the same light, the Soviet Republic, China, Japan, and various other countries are putting forth more or less aggressive efforts to compete with the products from America. That the competitors have succeeded is evidenced by the losses in newsprint paper sales in the comparative years of 1922 and 1927; in cover stocks, there was a slight gain, but nothing compared to the losses on uncoated book paper and several other types. Very appreciable gains have been made in sales of numerous paper products, and it is these gains which emphasize the activities of the American salesmen in foreign fields.

High Standards Essential

Sound methods and high standards have been fully developed in the sale of paper in the domestic markets, and they have proven very efficient boosters for ever-growing sales. In foreign trade the need for improvement is constantly urgent. In many instances sales of paper and valuable clients have been lost through no other cause than the lack of proper attention to applying the same sound methods and high standards to the foreign customers. These things only emphasize the importance of the right man for foreign sales service. Errors in the domestic field can be quickly and easily corrected: in the foreign field there is no close contact between seller and buyer except through the special representative. He, in truth, becomes every department of the paper manufacturing plant at one time and foreign business must stand or fall on his personality and decisions. That man must be mistake proof and the organization behind him at home must be equally perfect. No matter how perfect the foreign organization may be, it can only accomplish as the home organization co-operates. Therefore, foreign departments of all paper mills must be far more perfectly organized than those for domestic sales. Their standards must be extremely high, and errors must not pass beyond the paper mill. Foreign business requires greater executive insight and study, and it demands a dependable staff capable of handling all foreign correspondence with a full realization of its meaning.

Successful foreign trade depends on confidence and this can best be built through the proper representatives in the foreign field, plus the efficiency of the home organization behind them. In fact, that domestic organization must at all times fully sympathize with the efforts and trials of the foreign representatives and co-operate accordingly. One vital point often overlooked is that of not giving foreign orders and shipments a priority over domestic. A second is that of stinginess applied to samples for foreign representatives' use. American and Canadian manufacturers are often governed by the fact that China or India or Australia are merely countries to be served, forgetting that each one is technically a continent with as many provincial divisions as there are states in America, and each with a different set of difficulties to be overcome. Consequently, one or two sets of samples will not suffice,

and ultimate results are quite often influenced by this one item or its lack.

Supporting the Representative

Another vital point is that of fair treatment of all foreign representatives, whether American sales engineers or foreign firms. It must be recognized that all inquiries from any given territory belong to the representative at that point, and quotations must be protected to include the remuneration due such representative. Foreign representatives should receive commissions on all sales made either directly or indirectly, and they should also be posted about all details pertaining to indirect sales. Mill outputs must be so allocated as to protect the sales efforts of foreign representatives so that those efforts will not have been spent in vain.

Advertising allotments for foreign use demand a lot more serious consideration than is now being given to them and this advertising should in every instance be placed in the most drawing manner as suggested by the local representatives. Many foreign governments maintain offices in New York or London, and they invariably attempt to secure prices lower than usual simply because of such offices. In many instances, the desire for specific products is created by the representative at some foreign point and his remuneration should by all means be protected when quotations are made to buying offices in London or New York.

There are now eleven hundred and fifty million consumers becoming modernized in the area which is today the world's greatest market. This oriental market requires encouragement to reap future harvests. Constant study of this entire field by special representatives is necessary and of vital importance if paper manufacturers expect to show an appreciable increase in sales each year. Tastes through the orient are being changed because of the invasion of many modern products, and this in turn, affects the demand for paper. At the same time, American paper manufacturers must bear in mind that the markets of the orient must be coaxed and educated, and **not** high-pressured.

Ambition Is Good, But —

By MAURICE C. MOORE

IT has been said that proverbs, axioms, adages, "wise saws"—however you call them—are "the expression of the concentrated wisdom and the accumulated experience of the sages throughout the ages."

This rather more than slightly sententious observation, however, has been challenged on the ground that almost every positive proverb has its complementary negative, or opposite; in other words, for every "wise saw" that exists you can usually find another, looking no less sapient, that flatly contradicts it. Sancho Panza, henchman of Don Quixote, in fact proved as much, for he had a proverb for every conceivable time and occasion—the net result being that his tags were mutually destructive: each one cancelled out its neighbor and the crazed knight was left unmoved, and unweaned from his wildest extravagances.

Sometimes, however, some proverb has apparently no opposite, seeking to affirm the contrary truth, and this would appear to be the case with that old and familiar exhortation: "Hitch your wagon to a star." So far as I know, no tabloid wisdom provides any qualification of the assertion that it is good to hitch your wagon to a star. Finding it difficult to take anything for granted myself, without putting it to the test of everyday experience, let me try to provide a qualification.

Well, "hitch your wagon to a star" seems to me only to be good advice within limits. It means aim high; have confidence in yourself and your abilities; don't be content with a middling sort of success when you have it in you to reach a bigger one. Yet I would suggest that a too literal interpretation of its meaning has been, very frequently, a root cause of failure.

A good deal depends upon the star?

The actual stars in the firmament are of different sizes, and they are set at various distances. There is a "star," an ideal or goal, for each one of us, just exactly suited to our circumstances, temperaments, capabilities. The failure that not a few of us make at the start is a failure to realize what particular luminary is ours. No doubt it is very important to aim high; but is it not equally important not to aim **too** high?

Some beginners I have known, full of boundless enthusiasm, have definitely started out with aims altogether beyond their powers of achievement. They have been led to believe that all things are possible, and had to learn that, to the very best of us, only a limited number of things is possible.

Meanwhile their "star" receded into the distance the more they tried to "hitch," and finding finally that the conjunction could not be made, they have grown discouraged.

I was interested to see quoted the other day the remarks of a receiver in bankruptcy who had before him for examination a young man whose business schemes were described as "Napoleonic." "Young man," the official is reported to have said, "You might have done well had you kept your aspirations within bounds. But you wanted to be the Big Noise before you could be truthfully described as, shall we say, the "Faint Whisper": you might have won a decent position for yourself in trade: but now you are only paying a dividend of ninepence-halfpenny in the pound."

Perhaps the best way for the beginner is for him to set his desires upon something not too grand nor elevated, but just a little beyond his present reach,

keeping in mind all the time that in the background are the highest positions, one of which, when he has gained in power and experience, he means eventually to reach. In other words, it is most practicable to try and reach your "star" by using a sort of Jacob's ladder, rather than by fitting yourself up at the start with a pair of fancy wings.

If you are in a humble billet, it may be good to aspire to become, as soon as possible, president or managing-director of the company. But if you allow yourself to be quite fascinated by thoughts of what you will do when you have reached that exalted post, you will certainly feel impatient with the prospect of doing any job inferior to it. One cannot expect to jump right into such a post at a bound. There are many intermediate stages. The "star" of every beginner should be the next post immediately above him, no matter how humble it may seem. Let us forget, for a while, the presidency or managing-directorship, except as a bright, rosy hope for the future, and concentrate all we know upon rising just one step higher than our present level. Each advance made spells greater confidence. Gradually as we go, we become conscious of development that will enable us to fix our thoughts on securing a post not just a stage above our own, but one several stages farther on.

And so, in time, the really big star will blaze out brilliantly in full view, and the "wagon" that we have been putting together plank by plank as we travelled along can be linked to it and made—as we are assured by the advertisements is the case with the dye of our shirts and our new serge suit—"permanently fast."

Cost Accounting in the Paper Industry

Part XIV (Cont'd)—Handling General Expense

By D. A. WILCOX

THE usual manner of handling general expense in a standard cost system is to create a center to collect the general charges and then distribute the total of the center among all the operating centers each month in some predetermined manner. However, in the case of this single product mill, as will be remembered, we thought that this was unnecessary so long as a fair amount got eventually into the cost of the product, so that neither the cost of sales nor the inventory values were erroneously stated. This can be accomplished by setting up a general center but not distributing it and charging it directly to the product at some convenient point instead. It may be noted that this is not a real system in actual existence but something more in the nature of a practical suggestion.

Queries and Answers

In order to encourage discussion on the subject of cost accounting in the paper industry, the author of this series of articles is prepared to answer to the best of his ability any queries on cost accounting that may be directed to him.

This center takes all the general charges not definitely chargeable to other centers. It should include, among other things, the salaries of all the general executives, but not the salaries of foremen of specific departments, and take in all office expenses, as well as yard, chemists and the like.

It can be subdivided so as to collect the costs of the office, the yard, the laboratory and any or all other general activities if desired, but these should later be combined and the whole considered as one center.

Rate for General Expense

The totals of these expenses are estimated at the beginning of the year and divided by the normal production for the year to secure a standard rate per ton. This is best applied as the pulp goes over the dryer. There obviously must be some one definite point of application and that point is the one place in the mill where definite exact measurements can be obtained. It might be based on the production of the digesters but here a question of the exact weight blown makes it difficult. There would be no particular advantage in placing it there unless some of the pulp is sold in more than one form, as bleached and unbleached, or as dry and wet laps, etc. The question of a proper cost of pulp in process might be thought to enter here, but the quantity of such an inventory is usually too small to make any practical difference.

Assuming it to be applied at the dryer, we credit B.C. 9 (General Charges) and debit Pulp in Process with the tons dried at the standard rate per ton. The actual charges are, of course, debited to the center, any balance remaining being taken to represent the unabsorbed general expense, or "Unearned Burden and Variance."

Handling Fixed Charges

In the handling of fixed charges, a suggested rather than an actual method is presented. The total value of assets in the mill is determined and classified so that those of a similar nature and with approximately the same rate of depreciation can be grouped together. Depreciation can then be taken in each group separately and the total depreciation calculated.

Following is a suggested form or method of classi-

fication with percentage rates of depreciation:

	Per cent Depreciation
Brick and concrete buildings	2
Wood buildings	4
Machinery and equipment	4
Miscellaneous equipment	7
Motors and generators	7
Small tools, etc. charged off as issued. Set up to determine interest on investment if this is used.	
Miscellaneous construction	2
Motor trucks	20
Office furniture and fixtures	10

Each mill will, of course, have its own problems to face in determining rates of depreciation, until and unless a standard set of rates be established for the entire industry.

Taxes are estimated for the year in advance in the same way as insurance and other charges, such as rentals for railway sidings, water rights, etc. Included as part of the insurance charge should be the cost of watchmen, fire patrol and the like.

Reserve Accounts

The best way to handle insurance, taxes and the like which occur as large expenses at infrequent intervals is to set up reserves for them and thus spread the expense out evenly over the year. Each month is then charged with one-twelfth of the yearly total. This is debited to B.C. 10 (Fixed Charges) and credited to the reserve and then, as the actual expenses come through, the reserves are debited. At the end of the year any balances remaining in the reserves are charged off to Profit and Loss. They do not represent anything in particular unless it be to show how good a guesser the accountant is.

Light and Heat

Another class of expense that tends to make manufacturing seasonable so far as actual costs are concerned is light and heat, because it is natural that the expenses for coal and electricity will be greater during the cold periods and long evenings than during the summer and early fall months. To spread these costs out we set up reserves, estimating the total costs for the year and charging one-twelfth each month to B.C. 10. As before, the actual expenses are debited to the reserve and the balance charged off at the end of the year.

It may be difficult to determine the exact cost of light and heat. If meters are available no problem arises, but without meters the engineers will have to make the best estimate they can. In any event it will be better than ignoring the question entirely.

Repairs to Buildings

This was the subject of comment under Steam Plant, but reiteration will be useful. Items of repairs to buildings are apt to be infrequent and quite large when they do occur. For instance, a building may not need a new roof for many years and when it does it costs a lot. It would not be fair to charge the total cost to the period during which the roof is repaired so we set up a reserve for this also. Estimate the costs of such repairs over as long a period as possible—10 years if you can—then take a monthly average and charge this to B.C. 10, crediting the reserve. Actual expenses are again debited to the reserve and the balance charged off. It might be thought that it would be better to carry this reserve right along from year to year, and so it would if there were any assurance that the rate taken was absolutely correct, but as none of us is infallible it would be taking quite a chance to do so and the safe policy is to charge it off at the end of the year.

If there are no records available from which to estimate the cost of repairs to buildings, a rate of 3 per cent of the total value of the buildings, plus the building equipment, may be taken as a starter and will probably not be far out.

The Standard Rate

We estimate the total amount of fixed charges for the year and then, having allowed for those fixed charges which are credited to this center and charged to the steam plant divide the rest by the normal production. Here again we use the dryer production as a convenient point and the same remarks apply here as with the general charges. We charge off the balance to Unearned Burden and Variance each month.

Control of General Expense and Fixed Charges

The foregoing method affords a control of those difficult expenses, "general expense and fixed charges." We get the actual total each month and we see how much is unabsorbed. We keep them by themselves and do not confound them with any other expenses—too often they are hidden by redistribution among the other centers.

Fixed charges sound like an uncontrollable item, but it is not. Changes in equipment, method and processes will directly affect them. It is of considerable interest to note the extent to which the fixed charges change each year or when a new type of equipment is installed and what change, if any, there is in the standard rate. It would generally be thought that if a lot of new equipment is added there ought to be some corresponding benefit gained, but is there? If so it will show up in a reduction in the normal rate for fixed charges. If the rate continues to go up, the question that would naturally arise is, "what benefit are we securing from all these plant additions," and it is a very pertinent one. If the fixed charges are buried in

the various centers as a part of their rates, this important element is lost sight of. It is a good control (over long periods of time) and this way of handling them accomplishes it.

The following schedule is attached for the benefit of such of our readers as may wish to follow in detail our suggested standard cost system and understand how it would be set up and operated. It is necessary again to remind readers that this is not an actual system to be placed bodily into any mill, without modifications to suit particular problems and requirements.

Special Books Required

No mention will be made of the ordinary books required for general accounting as they do not enter into the costs and only those which apply to the cost accounts will be noted. There will be some here which are already a part of the general accounts but as we are trying to be somewhat complete they are included.

Cost Ledger—Containing inventory accounts, reserve accounts. etc.

Burden Ledger—An account for each burden center. (See Article 3 for suggested form)

Invoice Register—All incoming invoices are registered here and distributed to the proper accounts.

Bill Register—The same thing for outgoing bills relating to expenses; not the sales register.

Journal Vouchers—It is good to have a form containing a list of all the centers printed line after line in one column and then several—five to nine—blank columns. In this way labor, repairs, supplies and so forth can be analyzed, the various centers debited and the accounts credited.

A standard journal voucher for miscellaneous entries, particularly those between the cost ledger control and the general ledger control is a handy thing. This form is prepared to go into a regular loose-leaf binder and preferably 8½ x 11 inches. After the usual heading of the company's name, etc., it is ruled in lines and four columns with appropriate headings.

Two under the general heading "Cost Ledger."
Two under the general heading "General Ledger."

Entries from one account of the cost ledger to another can be made on these as well as entries from the cost ledger control to the general ledger control, and vice versa.

Job Ledger—To contain a record of repair and construction jobs.

Plant Record—Preferably a card index containing a record of each piece of equipment in the plant, with pertinent information.

Stock Record—A perpetual inventory of stock items.

Accounts

(Symbols shown are merely suggestive)

Inventory:

I-1 Wood.
I-2 Sulphur.
I-3 Limestone.
I-4 Bleach.
I-5 Liquid Chlorine.
I-6 Lime (Bleach).
I-7 Coal.
I-8 And so on for each raw material.
I-50 Finished pulp.
I-100-199 Supply items.
I-200-299 Repair items.

In Process Accounts:

P-1 Chips in process.
P-2 Pulp in process.
P-3 Acid in process.
P-4 Bleach in process.

Burden Centers:

B-1 Pond.
B-2 Wood room.
B-3 Digester room.
B-4 Bleach room.
B-5 Machine room.
B-6 Shipping and storing.
B-7 Steam plant.
B-8 Electric power.
B-9 General charges.
B-10 Fixed charges.

Variance Accounts:

V-1 Wood variance.
V-2 Sulphur variance.
V-3 Limestone variance.
V-4 Bleach variance.
V-5 Liquid chlorine variance.
V-6 Bleach lime variance.
V-7 Steam variance.
V-8 Digester conversion variance.
V-9 Coal variance.
V-10 Packing materials.

Reserve Accounts:

R-1 Light and heat.
R-2 Repairs to buildings suspense.
R-3 Railway siding rental.
R-4 Watchmen's expense.

Miscellaneous Accounts:

C-1 General ledger control.

Accounts in General Ledger Affected by Cost Accounts:

G-1 Cost ledger control.
G-2 Cost of sales.
G-3 Unearned burden and variance.
G-4 Material variance.
G-5 Price variances.
G-6 Conversion variances.
G-7 Reserve for depreciation. (One or more accounts if desired for each class of assets.)
G-8 Taxes prepaid or accrued.
G-9 Insurance prepaid or accrued.

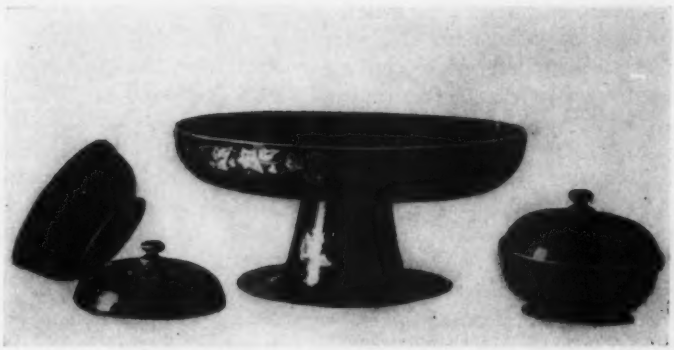
A New Industry in an Old Land

Hats from Wood Pulp

With the aid of a powerful compressor, wood pulp hats are stamped out at this new industry at Thetford, Norfolk, England. A feature of these hats is that they are used exclusively among the British miners, for besides being unbreakable they are very light.

Ornaments

Beautiful fruit and powder bowls made from wood pulp at Thetford. The bowls are unbreakable and extremely light.



Decorating Bowls

Workers of Thetford, decorating by hand the wood pulp vases and bowls turned out by the chief industry of this little village, which provides work for virtually the entire population. The bowls are unbreakable, light and inexpensive.

Finding Leaks in Rock-Filled Dams

Conservation of Water Increases Output of Low-Head Plants

By L. RANKIN

A DROUGHT on the Pacific Coast has necessitated curtailing the output of many hydroelectric plants in the State of Washington and also farther north, in British Columbia. The matter became of such importance during the Fall of 1929, that it savored almost of the days of the fuel administrator. Every year the importance of conserving water wherever it is used for hydroelectric purposes, becomes more apparent. Moreover, conservation would enable many low-head plants to be built profitably where now there are no plants at all.

There are a great many places where small hydroelectric plants could be constructed to advantage, notably throughout Wisconsin and nearby states, for paper mill purposes, etc.—plants, utilizing a head from a few feet up to possibly 50 feet, and representing a capacity anywhere from 100 to several hundred horsepower. One of the factors which makes such plants possible is the rock-filled dam, which is quite widely used throughout Wisconsin and nearby states on account of its low cost, using local materials. It is very easy to construct. Unfortunately, leakage may assume fairly large proportions with the rock-filled dam so that a large loss of water may be going to waste, in many instances without it being realized.

The rock-filled dam is usually sheeted on the upstream side, the sheeting being used to protect the filling or ground between rocks and to reduce the erosion and attrition due to the motion of the water. A dam newly constructed will be free from leakage. However, in due time the sheeting deteriorates and leakage becomes cumulatively worse as the leakage works a larger and larger channel through the dam, washing away the filling and in many instances the actual rocks.

Re-sheeting, of course, will solve the problem. Unfortunately, in many instances, the original sheeting was not driven down to solid rock, nor even down to the hardpan, so that leakage which has been tolerated for a considerable time may have ultimately undermined the entire dam. In such cases, the best way to approach the problem is to build an extra trench having a double row of sheeting, which would be driven well down to bedrock so as to preclude leakage.

A fact to be borne in mind is that in many cases, leakage occurs at a considerable distance away from the dam, rather than actually through the dam. The writer is familiar with one instance where a subterranean tunnel had been formed, starting at a considerable distance above the dam and emerging close to the back or downstream face of the dam. The only reason this subterranean tunnel was discovered was because during hot weather the water level was exceptionally low and a shortage of water brought about an investigation. In fact, in the instance cited, the shortage of water threatened to shut down the plant and it was the discovery of this subterranean tunnel that brought about combative measures which resulted in a very real conservation of water. It is believed that leakage through subterranean tunnels, as well as through the dams themselves, is very much more common than is usually understood. For this reason, a few observations on how to locate leakage and how to stop it may be of interest.

Locating Leaks

In some cases, leaks may be discovered by the naked eye. If the day is bright, if the water is not too deep, so that the bottom of the stream may be seen and if the water is clear, smooth and the velocity low, the holes may often be observed. A whirlpool occurring on the surface of still or clear water is always suspicious. It is more than probable that these are due to leak holes. Unfortunately, the velocity of the water may be high, the surface rough instead of smooth and the water turbid instead of clear. It is then necessary to resort to more scientific methods.

The electric light is a very useful tool. The lamp should be mounted in a marine socket or other waterproof fixture and should have a rating of 250 watts or more. Two men in a boat then explore the bed of the river traversely, going back and forth, from one bank of the river to the other and working gradually upstream from alternate sides, so as to cover completely every foot of river bed. The way to do this is to drive strong stakes in the ground, one on each side of the stream to which a row-boat cable is fastened. The boat is hitched to the row-boat cable, so that the boat is kept in the desired position upstream or downstream while one man pulling on the cable or rope is able to work the boat across the river from side to side. The other man meanwhile explores the river bottom by having the light as close to the bottom as possible. His assistant meanwhile watches for any sign of a suck-hole such as eddying currents, etc. After working across from one bank to the other, the stakes are pulled up and moved 8 or 10 feet or so, up or down stream, and the same process is repeated. This method is very simple, though rather tedious where the river is

wide. On the other hand, it is a very effective way of locating leaks.

Where the water is deep, turbulent or turbid, the light method cannot be used and can be replaced with a float or similar object which may be sucked down into the suck-hole or leak. In this case, the suck-hole or leak cannot be seen but the pull due to suction makes it felt. The area of the leak can then be determined more or less roughly by feeling it out with the float while the man who has been working the boat back and forth makes observations to determine the area involved while his partner probes and manipulates the float.

Plugging Up the Leaks

Once leaks have been located, filling them up is a simple matter. It is not so simple, however, to build them up so that they stay filled, and unless a thorough and conscientious job is done, it will not be long before another channel has been washed out. It is very important to bear in mind that a hole or other leak is invariably larger at its entrance than it is further inside the orifice. For this reason, it is extremely important to determine as closely as possible either by feel, observation or other means the shape and size of the entrance. To make a permanent job, small stones, loaded tin cans, sacks of ashes, and similar small obstructions should be dumped, prodded and pushed into the channel, tunnel or hole. When these have been rammed down as far as it is possible to go, sacks of cement and cinders should be dropped in position, their effect upon the suction being used as a guide as to the progress and effectiveness of the job. It is very desirable to leave a space of two to three feet from the top of the filling to the surface of the river bottom, and into this concrete should be poured to a thickness of at least two feet and preferably three feet, while the area covered should be two to three times the area of the original suck-hole. Concrete should be poured through a spout such as is used by contractors. The records of the amount of cement used should be kept so as to give some indication of the total number of cubic feet used.

There are certain seasons where river conditions are very favorable for tests such as described above. It is believed that many engineers will be surprised to find out how much leakage is actually going on, leakage that may play an important part in curtailing the output of hydroelectric plants during the summer months. There is another aspect to the situation, however, which is that washouts which occur from time to time through rock-filled dams could in many instances be prevented by the simple tests and remedies outlined above.

The Specialty Boxboard Mill

1910 vs. 1929—The Boiler Room

By F. E. CATON

This is the first of a series of articles by Mr. Caton that are intended to show how the old boxboard mill of 1910 can be fitted up to enable it to compete on a paying basis with the more modern plant. Succeeding articles will treat of the various departments of manufacture and describe the latest methods for formation and speed.

IN this day of increased production and strong competition with the modern mill of 1929, the management of the 1910 mill is asking themselves the question—how long will we be able to continue and meet the price of the more modern mill on a paying basis?

We know that the modern mill of to-day has a pulp mill (in some cases), a boiler room, turbine or engine room, breaker beater room, beater room and machine room consisting of modern equipment with the latest devices for efficient control including recording instruments that give the true story of what is taking place.

The 1910 mill has the same departments that the modern mill has, but in every case it has not kept step with the progress that has taken place in the past nineteen years by the installation of modern and efficient equipment.

Boiler Room of a Modern Mill

The boiler room is one of the most important departments of the mill, and precaution should be exercised in seeing that there is ample boiler horsepower to meet all of the demands efficiently.

The modern mill seems to favor the use of pulverized fuel where each boiler is 500 b. hp. or over, owing to the fact that the furnace is more flexible and takes up the load fluctuations in the steam plant better than does the ordinary stoker, yet there has been some very good results obtained from the latest type of underfeed stokers on boilers under 500 hp. The stoker has a distinct advantage over the pulverizer when wet coal is used, since stoker operation is not so seriously affected by moisture as in a pulverized coal system.

The pulverizing equipment now on the market are in three general classes: impact or hammer mills, centrifugal mills and ball mills. The two first mentioned, depend on high-speed operation to pulverize the coal. As for maintenance, the ball mill is much lower in cost than the other two types, but it is not so flexible in operation.

In using powdered fuel, moisture has to be reckoned with, as good results cannot be obtained where the

moisture content is more than 15 per cent without drying the coal before it enters the pulverizers. Several types of pulverizers use air as the medium for removing the powdered fuel from the machines with preheated air ranging from 250 degs. to 400 degs Fahr.

There are two pulverized fuel systems—the unit and the bin-and-feeder, or central system. The first system consists of one pulverizing unit which is placed near the boiler and the coal is fed directly into the furnace as it is pulverized. Some larger boilers have two or more pulverizers operating either singly or in parallel. The unit system is in successful operation on both large and small boilers and is especially suited to the average paper mill steam plant.

The bin-and-feeder or central system is most generally used where the boiler horsepower requirements are above the average mill and is most generally used where there is a chemical pulp mill in conjunction with the paper mill, and enough coal can be prepared in the daytime to run the boiler room from 24 to 36 hours.

The combustion of coal in pulverized form appears to be a logical process, as the operation is less affected by different grades of coal, and the modern, pulverized coal burning boiler operates at high efficiency, with steam pressures ranging from 200 to 400 lbs. This is also true of the latest type of underfeed stokers handling under 500 b. hp. per unit.

For the use of pulverized fuel, it has been necessary to develop boilers especially designed to burn this kind of fuel consisting of combined boilers and furnace unit. These embody a furnace with evaporating surfaces on all six sides. The four vertical sides and the top are built up of fin tubes, and at the bottom of the furnace, there is a bank of bare tubes about four rows deep, through which hot gases pass on their way to the stack.

Pumps and Feed Water Heaters

The three principal types of pumps used for pumping boiler feed water are: direct-acting steam pumps, centrifugal pumps (both single and multistage) and power-driven displacement pumps. The centrifugal pumps seem to have the preference, especially the multistage type. Most generally, one set is electric driven while the other set is driven by a steam turbine. In this way it enables the plant to maintain more uniform feed water temperature conditions, both winter and summer, since the exhaust steam is used to heat the feed water in cold weather.

We now come to the boiler feed water heaters which are classified under two general types: the closed type and the open type. The closed type feed water heater works under pressure (usually boiler pressure) and there are two general kinds—the water tube and the steam tube.

The open type feed water heater is preferable in paper mill work, though it takes up considerably more space than the closed type. Some standard, open, feed water heaters have heating elements above and a V-notch metering section below. Such a heater usually works under no pressure, or with exhaust steam pressure, up to 10 or 15 lbs. The temperature of the feed water in the case of the open heater is raised by the direct contact of the exhaust steam which goes into the water. It is, therefore, necessary to have oil separators on the steam line, and a hot well (reservoir for condensed steam) must be employed, since this is to some extent a settling basin and a reservoir for the feed pump.

Water Treatment

The treatment of boiler feed water is not possible within the scope of this paper, the details of which would require a complete treatise in itself.

The chemical treatment of water for a pulp and paper mill is not, as a rule, economically feasible, except in the case of water used for boiler feed. When water is heated under pressure and concentrated by evaporation, as in a steam boiler, the dissolved matter goes out of solution and solidifies, either as a hard scale or a soft sludge, depending on the character of the water. These deposits are poor conductors of heat, and they cause fuel losses that are out of all proportion to their thickness. If allowed to accumulate such deposits will shorten the life of the boiler, and may even cause boiler explosion.

Hardness in boiler feed water is the direct cause of scale, leaky flues, muddy burning and many of the other troubles incident to large scale steam production. It shortens the life and reduces the efficiency of the boiler; increases the repair expense and frequently causes inopportune and costly delays and shutdowns. Most harmful of all, the scale, acting as a thick and effective insulation of the flues, causes an enormous increase in the consumption of fuel. The fuel wastage due to the use of hard water may be anywhere from 10 to 30 per cent.

The cost of boiler cleaning, boiler repairs, boiler compounds, etc., all due to the use of hard water, is also a big item in the operation of a large plant. Boiler compounds should be viewed with suspicion. They are only temporary make shifts at best. A steam boiler is not designed as a vessel in which to carry out chemical reactions, and the constant adding of materials to the water in the boiler cannot help but corrode and weaken the boiler itself. The aim should be to supply as nearly as possible pure water to the boiler, the purification having been effected in a purification and softening plant outside the boiler system.

There are several systems on the market which come under the following classifications: lime process, soda process, lime and soda process and Zeolite process. One of these systems will more than likely give the desired results, providing an analysis of the water has been given to them.

The strong competition of our present age is forc-

(Continued on page 2154)

Current Thought by William Sibley

The Dynamic Age

"MY days are as swift as a weaver's shuttle," was the lament of one eighteenth century bard. If that were true then, by what would he compare his days of to-day?

How rapidly we have traveled! How far we have come! And in only ten years! Truly, a dynamic decade.

Since 1920, radio has emerged from its experimental chrysalis to a point where to-day it is an accepted necessity—with Walter Damrosch teaching hundreds of thousands of children better appreciation of music—paper sack and can opener brides being taught something of the culinary art—a hundred and sixty history teachers giving a particular one station program in Chicago to all of their students as an assignment in history—and millions of listeners gaining both education and entertainment. I am responsible for one local program which, although a sponsored feature, is being used as a definite, weekly educational assignment by more than one hundred and twenty-five public and parochial school teachers.

Back in 1920 such a performance would have been considered impossible—the mere idea chimerical.

This country in 1920 had 7,500,000 registered motor cars. To-day there are 26,500,000—and one person out of every ten is engaged in some phase of the automotive industry.

Ten years age there were no air mail routes. To-day there are 35,000 miles of established mail routes, nearly half of which are lighted for night flying. Air mail is saving and making hundreds of millions of dollars for industry every year.

Ten years ago commercial flying was limited to less than four thousand miles of established routes. To-day the commercial traveler can cover more than 25,000 miles of established air routes and at rates only slightly in excess of the railroads plus pullman fare.

Ten years ago the motor bus was considered a "gyp" enterprise. To-day there are over 48,000 motor coaches in daily use traveling over more than 200,000 miles of highways on definite time schedules. Just one of the 6,000 companies that make up the motor bus industry—the Greyhound Management Company—carried more than 16,000,000 passengers last year and operated their 1,800 motor coaches just seven times as safely as the private automobile.

Telephonic communication with steamships at sea, transoceanic flights, refueling of airplanes in mid-air, South pole geological explorations, airplane endurance flights,,300 miles an hour speed for automobiles, aerial photography, stock tickers on ocean liners are just a few of the commercial and industrial developments of the past dynamic decade.

But however far and fast we **think** we have traveled during the past decade, we have only cynical laughter in store for our judgment when we reach the next ten year goal and look **back** at the "thirties" as we now look back at the "twenties."

In the language of Floyd W. Parsons, American business has done a lot of traveling in the recent past. Life has established itself on a new plane. Because of this, people in positions of authority are being required to prove their ability; fact is fast supplanting theory, and practices are being measured in terms of profit they produce. More and more critical are becoming the eyes which watch management and business is more and more becoming hard-boiled and demanding results instead of alibis.

And, significantly, those managements which produce instead results of dealing in alibis are those managements which readily adapt themselves to changing practices and act as bell-wethers in accepting new ideas.

Where formerly the salaried employee in the United States received an average of $976.00 a year, that same employee now receives an average salary of $2,084.00. Wage workers have increased their average income from $527.00 to $1,205.00 a year. Whereas agriculture had an income of five billion, its income last year was over eight billion. Manufacturing increased from five billion to twenty billion dollars. Mercantile incomes increased from

three billion seven hundred million to fourteen billion dollars, while the incomes from our unclassified industries increased from six billion to eighteen billion dollars.

Even the most superficial examination of current facts and figures will indicate clearly that we have, during the past ten years, actually gone through an economic revolution. And, unfortunately, the far-reaching effects of this revolution too few of us fully appreciate. Our population has increased fourteen and a half million persons. Several million citizens have become participants in the ownership of corporations. Natives in Central and South American countries—people who have never had shoes on their feet—are now shareholders in local companies under American management. This financial set-up of industry is in amazing contrast to that of just a few years gone by.

So many men and women in the United States are now earning money that those who classify themselves as dependents are less than one and one-half times those of wage earners. In the past ten years the electrical industry has added more than twenty-five million horsepower to its generating capacity—and on his last birthday Edison said that electricity was in its "adolescent" period—just out of "infancy."

In spite of the fact that only forty-eight million people in the United States are wage earners, sixty-five million are insurance policyholders. Over one hundred billion dollars in insurance is carried by the American people, whereas just thirteen years ago the life insurance carried in the United States was a little less than twenty-five billion dollars. Whereas, it took eighty years for life insurance in our country to reach a total of fifty billion dollars it required less than seven years for the second fifty billion dollars to be added. This in itself is something of an indication of the speed of our present day progress.

In spite of the rapidity of our growth, our development has not been of the mushroom character. There is sound reason for every phase of our development. Our whole public viewpoint has recently become that of the engineer and the analyst. Our church attendance is suffering severely because of the growing tendency among Americans to reason for themselves. We are no longer a nation of theory clingers, but a nation of addicts to facts and figures. We have largely turned away from impractical sentimentality and made ours a business man's civilization. We have come to understand that we can give thoughts to making of profits—can be reasonably materialistic—and yet develop for ourselves a humanely rounded life, worthy of all the theoretical goals set up for us in childhood. It has become clear to us that economic independence and happiness can walk hand in hand.

Doubtless much of our materialism has its evils, but if it were not for this same materialism having been flung to the far ends of the earth, the burdens of humanity would not have been lightened so greatly and civilization would not have advanced so far from the manual methods and the twelve-hour shifts of yesterday. While, of course, we are always making mistakes and being forced to pay for them (right now we are settling a heavy bill charged up against us for having engaged in a foolish orgy of gambling on the stock market) those people who are now filled with doubts concerning the future of the United States should take time to uncover the truth and to get a better idea of the substantial character of this country's industrial progress. There is no cause for worry in the present situation. Our present condition represents a healthy program of development which is weaving around the great nations of the earth a network of industrial interests that will do more to make world wars an impossibility than all the naval conferences of the past or future.

The foundation of American life and business is more sound today than ever before. We are just commencing to capitalize in a stupendous way the unmeasured wealth of our natural resources. Our temporary, spring house-cleaning will soon be finished, commodity prices will quickly stabilize, stores of unsold goods are already being used up and new orders placed. Confidence will be restored and every one will turn seriously to the great job of pushing civilization to still higher levels.

Let us not forget that it is in times like the present when the basis is laid for the building of great fortunes. Today should be regarded as a time of opportunity, not adversity.

The Specialty Box Board Mill

(Continued from page 2152)

ing every manufacturer to run his boiler plant in the most economical and efficient manner. The costs of power and heat are in general a considerable part of the total manufacturing costs. Nevertheless, in many plants which are otherwise modern, the boiler house is neglected. In those plants that are keeping pace with engineering progress, there is a clear tendency toward larger boiler units operating at higher working pressures and higher ratings than heretofore. Thus, we have one modern boiler in operation to-day where several boilers were in operation 10 to 20 years ago.

With such a great increase in the fuel consumption of each boiler unit, it is more apparent than ever that it pays to check up on the operating conditions of each boiler in order to maintain all adjustments at the point of maximum efficiency. Thus, much of the auxiliary equipment which would not yield a profitable return on the small boiler at low rating, pays such dividends on the large boiler that it becomes an economic necessity that the operator has in plain view the proper recording devices to maintain the highest efficiency.

The Paper Industry 1930 Safety Contest

January Scores

41 Mills Have Perfect Record

PERFECT SCORES

	PARTICIPANT	MILL	LOCATION
GROUP A	Champion Coated Paper Co.	No. 2	Hamilton, O.
	Kimberly-Clark Corp.	Kimberly	Wisconsin
	Canada P. & P. Corp.	Laurentide Div.	Grand Mere, Que., Can.
	International Paper Co.	No. 2	Fort Edward, N. Y.
	Nekoosa-Edwards Paper Co.	Port Edwards	Wisconsin
	Kimberly-Clark Corp.	Badger-Globe	Neenah, Wis.
	Anglo Canadian P. & P. Mills	Limoilou	P. Q., Canada
GROUP B	Mead Fibre Co.	Kingsport	Tennessee
	Nekoosa-Edwards Paper Co.	Nekoosa	Wisconsin
	Strathmore Paper Co.	Mittineague	Massachusetts
	Dells Paper & Pulp Co.	Eau Claire	Wisconsin
	Brown Paper Mill Co., Inc.	West Monroe	Louisiana
	St. Croix Paper Co.	Woodland	Maine
	Cornell Wood Products Co.	Cornell	Wisconsin
	Kenora Paper Mills, Ltd.	Kenora	Ontario, Canada
	Falls Mfg. Co.	Oconto Falls	Wisconsin
	Alton Box Board & Paper Co.	Federal	Illinois
	Crocker-McElwain Co.	Holyoke	Massachusetts
	Container Corp. of America	Cincinnati	Ohio
	Crystal Tissue Co.	Middletown	Ohio
	Kimberly-Clark Corp.	Lakeview	Neenah, Wis.
	Finch, Pruyn & Co., Inc.	Glens Falls	New York
GROUP C	Container Corp. of America	Mid-West Div.	Circleville, O.
	Port Huron Sulphite & Paper Co.	No. 1	Port Huron, Mich.
	Marinette & Menominee Pa. Co.	Menominee	Michigan
	Lowe Paper Co.	Ridgefield	New Jersey
	Can. Int. Paper Co.	Fibre Board	Gatineau, Que., Can.
	Int. Paper Co.	Webster	Orono, Maine
	Monroe Paper Prods. Co.	Monroe	Michigan
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	Defiance Paper Co.	No. 1	Niagara Falls, N. Y.
	Sorg-Oglesby-Smith P. Co.	Oglesby	Middletown, O.
	International P. Co.	Livermore Falls	Maine
	International P. Co.	Winnipiseogee	Franklin, N. H.
	U. S. Gypsum Co.	No. Kansas City	Missouri
	Union Bag & Paper Corp.	Allen	Hudson Falls, N. Y.
	International Paper Co.	Riley	Maine
	U. S. Gypsum Co.	Gypsum	Ohio
	Lawrence Paper Mfg. Co.	Container Board	Lawrence, Kans.
	Continental Paper & Bag Corp.	Greenwich	New York
	U. S. Gypsum Co.	Lancaster	Ohio

IMPERFECT SCORES

GROUP A				GROUP B				GROUP C			
		Points				Points				Points	
KEY	Rank	Credit	Debit	KEY	Rank	Credit	Debit	KEY	Rank	Credit	Debit
A- 1	8	510.920		B-41	16	380.180		C- 9	20	18.620	
A- 2	9	472.160		B- 3	17	346.900		C-14	21		52.580
A-15	10	442.520		B-29	18	306.940		C-11	22		128.720
A-10	11	435.580		B- 7	19	269.540		C- 5	23		155.840
A- 7	12	414.160		B-10	20	141.280		C-38	24		195.360
A- 6	13	406.140		B-33	21	111.020		C-34	25		428.960
A-25	14	386.440		B-39	22	56.840		C-35	26		450.040
A-33	15	341.800		B-24	23	5.620		C-32	27		502.380
A-26	16	233.460		B-16	24		3.600	C-17	28		550.600
A-30	17	224.000		B-42	25		66.100	C- 6	29		821.700
A-28	18	179.840		B-13	26		136.660	C-15	30		858.700
A-21	19	175.340		B- 5	27		156.800	C-16	31		871.320
A-20	20	153.700		B-30	28		261.920	C- 3	32		1303.360
A-31	21	146.980		B-12	29		285.000	C-41	33		1347.560
A-13	22	144.300		B-14	30		312.180	C-45	34		1515.940
A-24	23	141.720		B-38	31		346.920	C-24	35		1517.180
A-22	24	24.320		B-36	32		512.720	C- 7	36		1696.520
A-14	25	18.320		B-31	33		536.620	C-29	37		1836.180
A-18	26		4.920	B-26	34		679.180	C-46	38		2584.860
A- 4	27		81.440	B- 6	35		915.660	C-22	39		2706.840
A-32	28		171.900	B- 2	36		1134.680	C- 8	40		2880.620
A-34	29		442.140	B-40	37		1919.940	C-18	41		3151.140
A- 3	30		496.560	B-34	38		1977.440	C- 1	42		3121.920
A-29	31		551.940	B-11	39		2169.760	C-37	43		3894.860
A-11	32		823.720								
A- 9	33		1045.920								

No Report Received:-
A-17, B-20, B-21, B-37,
C-19, C-20, C-21, C-40

Monsson Leaves Forest Products Laboratory

W. H. Monsson, chemist on the pulp and paper staff at the U. S. Forest Products Laboratory, will leave the laboratory March 20 to join the Munising Paper Co., Munising, Mich. Mr. Monsson, who is a graduate of the University of Illinois, accepted appointment to the Forest Products Laboratory staff in 1923. He received his M. S. degree from the University of Wisconsin in 1925. The major portion of his time has been spent on sulphite pulping research.

It is expected that in his new position Mr. Monsson will be concerned with both production and research.

Position of Papermaking Clays in the United States

In a report on Clays contributed by Paul M. Tyler and Oliver Bowles to **Chemical and Metallurgical Engineering**, xxxvii, 1, 1930, in the course of a general study of the position of the United States as a producer, consumer and importer, it is shown that the American kaolin industry has always encountered keen competition from abroad. The authors state that foreign clays, particularly the carefully graded English clays, were strongly entrenched both in the pottery and in the paper industries, and it has been difficult to induce manufacturers to change their formulas. The World War forced the use of domestic clays and American producers seized this opportunity to establish a permanent industry. Abundant supplies of high grade clays have been developed in the United States, and although competition is still keen, producing companies have found faith enough in the future to encourage them to build modern, well equipped plants.

In order to improve the quality and assure uniformity of domestic clays, producers soon found it desirable to install washing equipment for the mechanical removal of impurities. Until relatively recently, however, these treatment processes were quite simple and purely mechanical. The use of electrolytes for controlling dispersion is one of the newer developments. In the paper industry, prior to 1925, domestic clay was being used for loading or filling, but practically no satisfactory American coating clays were available. After the Edgar Brothers Company perfected its processing methods, however, imported clays were displaced by domestic, which in 1929 comprised approximately half of the clay used by the paper-coating industry. Processed or bleached clays are also used for the highest grade filler work.

Butterworth Changes in Organization

H. W. Butterworth & Sons Co., Philadelphia, announces a number of changes in its organization. J. Ebert Butterworth, who is vice president of the company and for the past several years has been in charge of the Southern office, will direct all sales activities with headquarters in Philadelphia. J. Hill Zahn, who has been associated with Mr. Butterworth in the South, has been made manager of the Southern office at Charlotte, N. C.

It is also given out that the Bethayres plant, is now known as Plant No. 2, H. W. Butterworth & Sons Co., instead of the Klauder Weldon Dyeing Machine Division. The executive and sales offices of the Klauder Weldon Division, formerly located at Bethayres, have been consolidated with the Philadelphia sales department.

The Paperboard Industries Association will meet March 25, 26 and 27, 1930 at the Commodore Hotel, New York City. General and Group meetings will be held and there will also be a meeting of the Trade Practice Committees at which Gilbert H. Montague, Trade Practice Counsel will be present.

Fraser Companies, Use Interesting Conveying System

Conveys Pulpwood Logs from River to Barkers, and to Wood Room or Storage Pile

A PARTICULARLY modern and efficient method of conveying pulpwood from the river to the Thorne Barkers, and from the barkers to the wood room or storage pile has been installed at the Edmundston, N. B., pulp mill of Fraser Companies, Ltd.

The system embodies some innovations in the handling of this class of materials, as shown by the accompanying illustrations of these conveyors.

In Figs. 1 and 2 are shown the three inclined log haul-up conveyors, each operating in a separate trough, for conveying the logs endwise, up from the river to the three long horizontal transfer conveyors, seen in Figs. 3 and 4.

The log haul-ups each employ a single strand conveying

Fig. 1—The three inclined haul-up conveyors

Fig. 2—Logs being conveyed endwise up from the river

Fig. 6—Continuously-moving platform where logs are sorted

Fig. 4—Note the special transfer wheel at end of one transfer conveyor for transferring the logs from endwise conveyance to crosswise carrier

Fig. 3—Three long horizontal transfer conveyors

Fig. 5—Three carriers which feed the logs to the barkers

medium of Link-Belt combination malleable iron and steel "C" class chain, made up with "S" spur steel side-bar attachments at suitable intervals, to keep the logs from sliding back. The transfer conveyors each employ two strands of this chain side by side, but, as they operate horizontally, the spur pushers (or retarders) are not required, and therefore have been omitted.

The transfer conveyors are better shown in Fig. 4, as is one of the special transfer wheels at end of one, for transferring the logs from an endwise conveyance to crosswise carrier. There are three of these crosswise carriers, or feeder conveyors, as shown in Fig. 5, for feeding the logs to the barkers for de-barking, each feeder conveyor receiving the discharge of one of the three horizontal transfer conveyors.

The transfer wheels are rather interesting. They run at a higher peripheral speed than the transfer conveyor line speed, and thus we have an automatic transfer of a better construction than has been used formerly.

The short feeder conveyors (patent applied for) are of the traveling apron type, with steel retaining sides. The apron consists of steel plates and cross angles, mounted on two strands of chain, and serves to discharge the logs into the working mechanism of the barkers in the right way at the proper rate.

In Fig. 6, at the left is a flat-top sorting table conveyor, made up with a double strand of steel roller chain upon which steel channels are mounted to form the continuously-moving platform on which the logs are sorted. In the background, at the left, near foot end of conveyor, you can see the three points where the logs are discharged onto it from the barkers. The conveyor apron, or platform, is of a very rugged construction, as is required for such service.

This conveyor discharges the logs that have passed inspection, either to the wood room, or to a storage pile. The rejected logs (those requiring further de-barking) are shoved over into a trough of the single-strand-chain reject conveyor, which is shown at right in Fig. 6.

The reject conveyor carries the rejected logs back, over an inclined conveyor into one of the transfer conveyors, to pass again through crosswise feeder conveyors to the barkers, and finally back onto the sorting table conveyor.

The parking plant just described was engineered by W. H. Wharton of Canadian Allis-Chalmers Co. Ltd., working in co-operation with Link-Belt Limited, Toronto, who supplied all chain, sprockets, and miscellaneous transmission machinery.

Committees Appointed to Revise Container Specifications

J. D. Malcolmson, Division of Design, Robert Gair Company, New York City, has been appointed by the American Society for Testing Materials, chairman of sub-committee on fiber and corrugated shipping cases. This is a sub-committee of committee D-10, which is in charge of standard specifications of all types of wooden, metal or paperboard containers.

Recently there has been felt a need for a revision of the container specifications and committee D-10 will form a common meeting ground for all competitive and non-competitive interests to work out advancements in shipping containers. The society also feels the need for developing nomenclature with definitions of terms used by shippers and the container industry, methods of test, standards of quality of materials and methods of measuring dimensions.

Annual Meeting of Farrel-Birmingham

At the annual meeting of Farrel-Birmingham Co., Inc., held at the general offices in Ansonia, Conn., on February 20th, Franklin Farrel, Jr., formerly vice president, was made chairman of the board, and N. W. Pickering was elected president to succeed Walter Perry.

D. R. Bowen, chief engineer, Carl Hitchcock, formerly assistant secretary, Franklin R. Hoadley, manager of the foundry department and A. G. Kessler, manager of Buffalo Division were elected vice presidents.

E. H. Berges will succeed Mr. Pickering as manager of the roll department.

Asbestos Dryer Felts

Direct Cost Cut $1,690 Yearly—Important Benefits Indicated

FOLLOWING is a survey of the performance of Asten Asbestos Dryer Felts on top dry position of 234-inch news machine. This survey was made by A. C. Nielsen Company, engineers, Chicago, in collaboration with and approved by E. D. Hyndman, mill manager, Brompton Pulp & Paper Co., Ltd., Bromptonville, Quebec.

Results obtained with the first Asten Asbestos Dryer Felt tried out by the Brompton Pulp & Paper Company, Ltd., have warranted continued use of such felts and the management expects soon to have them on all four positions of the 234-inch high-speed Walmsley news machine operated at the Bromptonville mill. This report will outline briefly the mill's experience with the original 240 inch x 228 foot Asten felt which served for a period of 249 working days during which the machine output totalled 29,229 tons. This run was about 3¼ times the average obtained with the duck felts formerly used in this position and the direct felt cost per ton of paper was thus reduced nearly 43 per cent.

Comparative Direct Felt Costs and Savings Effected by Asten—The following tabulation shows the direct costs for the original Asten felt in comparison with corresponding items based on average experience with duck felts formerly used in the top dry position:

	Asten	Duck
Life, working days	249	77
Paper output, tons	29,229	8,951
Total costs:		
Purchase price	$1,812.20	$957.76
Handling labor—(See Par. 9, 10 & 11)		
16.5 hr. @ $0.50	8.25	
10.5 hr. @ $0.50		5.25
Totals	$1,820.45	$963.01
Direct felt costs, per ton of paper	$ .062	$ .108
Net Savings:		
Per ton	$ .046	42.6%
Per year—$0.046 x 36,750 tons	$1,690.50	

General Advantage of Asten Asbestos Felts—The reduction of 42.6 per cent in direct felt costs, resulting in a net annual saving of $1,690.50 on the top dry position, is the only definitely measurable gain thus far observed but is considered sufficient of and by itself to warrant further trials of Asten asbestos dryer felts. The operating experience to date has suggested several other sources of additional saving, however, any or all of which may develop later.

For example, there has been a noticeable decrease in cockles. This has not as yet resulted in any appreciable reduction of broke but the point is considered well worth watching.

Machine speed is now slightly greater than when duck felts were used exclusively. Unfortunately, there have been changes in conditions at the other end of the mill which also reflect in this and it is impossible to determine how much credit is due to the introduction of Asten felts.

Laboratory tests with a densometer have suggested that the Asten felts should result in some economy of dryer steam although this has not as yet been observed under normal operating conditions. The suggestion comes about through laboratory results which show the porosity of Asten felts to be at least three times that of duck felts when both are new and about eight times as great at the time the felts are removed.

Machine Data—The 234-inch Walmsley news machine at Bromptonville has 44 dryers and is designed for an operating speed of 1,200 f.p.m. Steam is supplied from the exhaust header of the mill's turbo-generators, supplemented by a live steam booster line, and is delivered to the dryers at 10 pounds gauge pressure. The machine works on a 24-hour schedule for six days a week and produces from 120 to 125 tons of news daily at an average operating speed of 975 f.p.m.

Felt Data and Handling Methods—Four dryer felts are run—one top and one bottom each on both wet and dry posi-

tions. Each felt runs over eleven cylinders. The original Asten felt was used on the top dry position which is considered the hardest one on the machine. It measured 240 inches by 228 feet but has recently been replaced by a felt 236 inches wide. A second Asten felt is now in use—on the bottom wet position—and it is expected that Asten felts will be applied to the top wet and bottom dry positions within the next few months.

All felts are put on with a boot-leg seam when first applied. The mill has thus far renewed the seam of an Asten felt but once. The renewal was done with an ordinary flat seam about 8 inches wide after about 200 days of use and this seam went through the remaining 49 days of the original run without trouble. There was no perceptible stretch in the Asten felt at any time.

The original mounting of an Asten felt in the top dry position required 1½ hours of work by an 8-man crew. The seam renewal mentioned above took ¾ hour for a crew of six men. The total felt handling labor was thus 16½ man-hours for the 249-day run.

Duck felts of the kind formerly used ran about 77 days in the top dry position. They were delivered for use in a somewhat more convenient form and the original mounting usually took a 6-man crew about an hour. One seam renewal was generally required during each run and the labor requirements for this were the same as at present. The total handling labor was thus 10½ man-hours per felt.

Summary

Canadian mill produces 120 to 125 tons newsprint daily.

On 234-inch Walmsley machine rated 1,200 f.p.m.
Runs 24-hour schedule for six days a week.
And turns out about 36,750 tons of paper a year.

Put on first Asten felt on Nov. 25, 1928.

Over 11 dryers in top position, dry end.
Felt ran 249 working days until Sept. 15, 1929.
Total output was 29,229 tons of paper.
Stretch was negligible—one seam renewal made after 200 days of use.

Duck felts in top dry position averaged 77 days.

Total run per felt was about 8,951 tons.
Direct felt cost averaged $0.108 per ton as compared with $.062 per ton for Asten.

Net saving with Asten felt on top dry position alone is $.046 per ton—42.6 per cent.

Amounts to $1,690.50 a year on 36,750 tons.
Showing on first felt believed to warrant present use on bottom wet as well as top dry position and contemplated use all around.

Kalbfleisch Corporation Acquires Salt Cake Deposits

"Announcement is made of the formation of the Arizona Chemical Company to take over the natural salt cake (sodium sulphate) deposits near Clarkdale, Arizona, formerly operated by the Sodium Products Corporation.

The principal product of this Company will be salt cake for the paper, glass, stock feed and other industries. This production will fill the demand which has been in the past to a large extent filled by importations of salt cake from Europe.

It is estimated that during 1929, approximately 100,000 tons of salt cake were imported into this country from Europe. This source has now been practically eliminated due to a change in the process of manufacture of muriatic acid, of which salt cake is a by-product. Production of salt-cake in the United States has also been curtailed, due both to the change in muriatic acid process, and the fact that nitric acid is now largely manufactured from ammonia rather than from nitrate of soda.

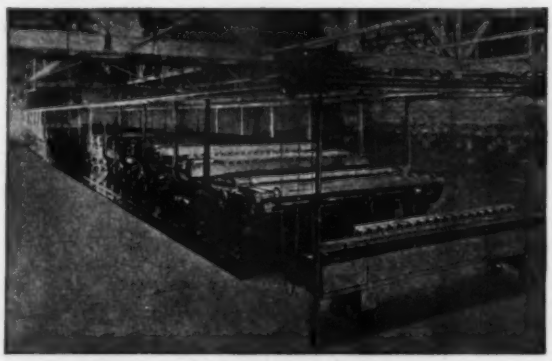
The Arizona Chemical Company will be operated by The Kalbfleisch Corporation, with offices at 200-5th Avenue, New York City. The sale of its products will be handled jointly by The Kalbfleisch Corporation and A. Klipstein & Company.

Extensive alterations and additions to the present equipment will be made, and it is expected the plant will be in operation by April 1st.

A Machine for Printing Floor Covering

Modern floor coverings, which consist usually of a linseed oil or other suitable plastic composition laid upon a felt base, are printed flat, which, together with the multiple color effects and the complicated designs employed, and the great width of the material, requires a large and complicated machine. The accompanying photograph shows such a machine, built by Dienelt & Eisenhardt of Philadelphia, and installed in the plant of the Sandura Co., Paulsboro, N. J., manufacturers of felt base floor coverings.

This printing machine will accommodate fabrics 12 quarters wide, equivalent to 9 feet, and is designed to make 15 different impressions upon the body, and a like number upon the border. The whole machine is mounted upon wheels running



on rails laid across the floor so that it can be shifted to deliver the printed material into any one of a number of ovens wherein the final hardening or drying takes place.

The material is drawn through the machine with an intermittent motion, which is synchronized with the action of the printing blocks, so that the fabric is stationary at the moment when it receives each impression. As the fabric comes to rest under the printing heads, the latter are automatically lowered and raised by cams, each head impressing one design in one color upon the material. The paint is transferred to the printing heads by paint wagons, which shuttle under the heads while the latter are at the top of the stroke.

The cams operating the printing heads are driven through 30 DeLaval worm reduction gears, each having double gear shaft extensions and double worm shaft extensions. The worm shafts are connected together in series by flexible couplings to form, in effect, a continuous line shaft, which is driven from a 40 hp. 1160 r.p.m. motor by a silent chain and a special combination of worm and small helical gear built by the DeLaval Steam Turbine Company of Trenton, N. J., and giving a combined reduction ratio of approximately 120 to 1. Another DeLaval gear transmits the power for traversing the machine. The high efficiency of the gears, of which there are 31 altogether besides the traversing gear, and the precision of construction of the printing machine, is shown by the fact that one man can easily turn the drive shaft operating the entire machine.

New Self-Lubricating Bearing

A new self-lubricating bronze bearing, said to be the only one of its kind, has just been announced by Johnson Bronze Company, New Castle, Pa., makers of bronze bushings, bronze bearings, bronze castings, cored and solid bar bronze.

According to P. J. Flaherty, president and general manager of the company, the new bearing provides for a uniform area of bearing surface on the pressure line, and insures an efficient distribution of lubricating compound. The compound used is also a Johnson Bronze development.

The improved results are obtained by a new method of effecting identations in the metal and by placing them on an angle of 30°. Patent covering this method has been applied for.

Much interest has been evinced already, especially by the makers of machinery and parts subject to intermittent or

periodical operation, such as brake levers, clutch levers, shock absorbers, rocker arms, slow running journals, starting motors, landing gears, guide rollers, sliding door rollers and the like.

An Improved Log Grab

In older designs of log grabs the grab tongs turn around two stationary points which are located in a box-like structure as shown in Fig. 1. The points of these tongs describe circular arcs about the pivot.

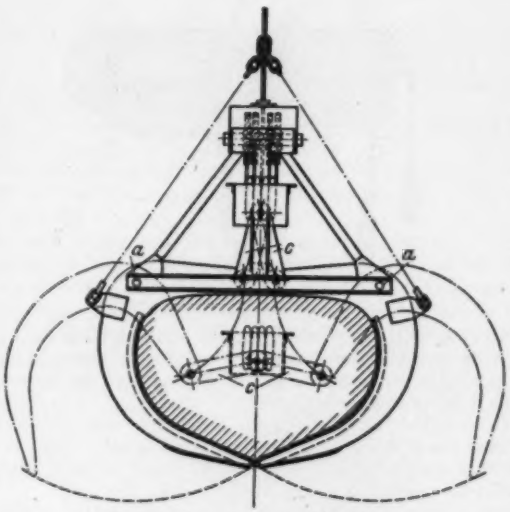


Fig. 1—Log grab of older design

In contrast to this so-called tong grab, the new log grab shown in Fig. 2 is designed as a so-called rod grab; that is, the pivots (a) of the grab tongs swing during the gripping motion on their part again around the points (b) of the upper grab frame. In this manner a flatter gripping curve of the tong points is obtained in place of the circular arc. Tests have shown that this more scraping than digging movement increases the quantity of material that can be grabbed.

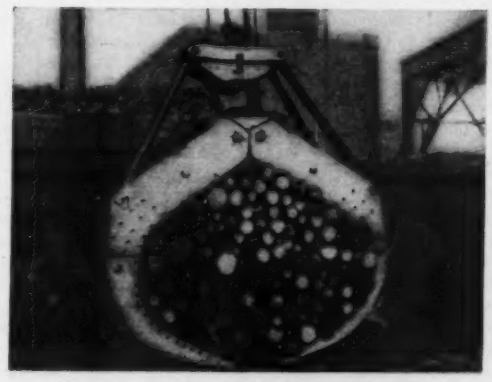


Figure 3

In order to provide room for this increased quantity, the cross section has been enlarged towards the top. This is indicated by the areas enclosed by the stroked lines in Figs. 1 and 2.

The tests have shown also that the locking force of the grab is capable of filling this enlarged cross section in continuous operation. Frequently, the grab takes more than its mouthful, so that the points of the tongs are 8 to 12 inches apart. Furthermore, the new grab avoids a shortcoming of the older grabs, namely that during closing of the grabs, wood is caught between the levers and crushed. The log grab has shown an increase in handling output per unit of time of 40 to 50 per cent. Fig. 3 shows this new grab in closed position and holding its customary load in one of the several plants for which it has been built by the Mohr and Federhaff machine factory, Mannheim, Germany.

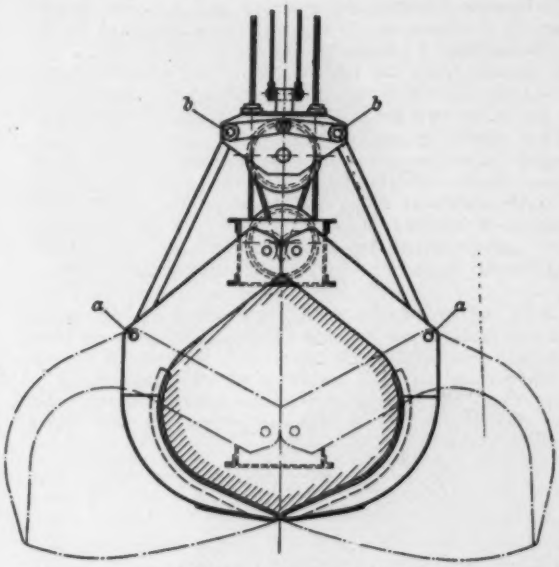


Fig. 2—Log grab of new design

New Chromite Cement

Botfield Refractories Company, Philadelphia, Pa., has developed a new high temperature cement which will be added to its line of Adaproducts and sold under the trade name of Adachrome Plastic Super-Cement.

In this new cement, the basic material is an exceptionally high-grade chromite ore obtained from South African deposits.

Because of its chromite base, Adachrome Plastic Super-Cement is chemically-inert, and is also hard, dense and highly refractory. Furthermore, the new cement employs a bonding agent which is very efficient at high temperatures.

Among the destructive furnace actions to which this new cement is resistant are basic and acid slags, molten metal penetration, abrasion, erosion and chemical reaction in the burning of acid sludge. In addition, the material, when applied as a surface coating on boiler settings, protects the brickwork from the penetrating action of clinker and fusible coal ash.

In the field of chrome cements, Adachrome Plastic Super-Cement is reported to be the only cement sold in plastic form, ready for use without laborious mixing prior to use. The material is suited for making either dipped or troweled joints.

Another feature of the new cement is its exceptional plasticity, which contributes to ease of handling and working. The material is recommended by its manufacturer for laying up fire clay brick, silica brick, chrome brick, high alumina brick and also for laying up magnesite brick under certain conditions. It is also adaptable for use as a surface coating material, and as a binder in the mixture of patching materials for repairing burned-out sections of refractory construction.

This new cement will be packed in heavy gauge metal drums with full-size openings adding to convenience of use. The drums, which are painted a distinctive yellow with red lettering, have air-tight covers that prevent waste or deterioration of the material. Two sizes of drums, 250 lb. and 500 lb., are available. Complete data is offered by the manufacturer to those interested.

Carlyle Johnson Brings Out Improved Clutch

An improved clutch, known as the Super-Clutch, has been brought out by The Carlyle Johnson Machine Company, Manchester, Conn. In the past, carbon steel drop forged clutch fingers, also called "clutch levers" or "toggle levers," have been used and have given a powerful and dependable grip over a long period of time without excessive wearing, slipping, or faulty catching. The new Super-Clutch is equipped with chrome nickel steel fingers which are guaranteed to further increase the wearing qualities and reduce breakage to a minimum. It has also been improved by installing a method of locking the adjusting screw. With this locking arrangement, the adjustment on any clutch remains where it is set by the operator. The adjusting screw cannot loosen up of its own accord due to vibration, high speed or any other operating conditions.

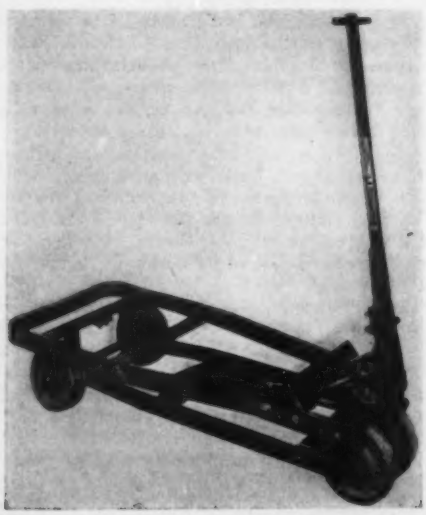
Another improvement is the replacement of tool steel adjusting blocks with chrome nickel steel adjusting blocks; these small parts are really the heart of the clutch. The elimination of breakage from fire cracks in the hardening of these parts through the use of chrome nickel steel adjusting blocks practically makes the super-clutch trouble-proof.

A fourth improvement is the alemite system of lubrication. The alemite feature on a Johnson Clutch means only one point of lubrication necessary on the clutch instead of two or three when using oil. The result is, no oil soaked floors or ceilings. This high pressure lubrication system forces grease to the interior and continuously lubricates all parts thoroughly.

A New Lift-Truck

A new, light duty lift-truck, with 25 lbs. capacity has just been announced to the trade by the Barrett-Cravens Company, Chicago. This truck is guaranteed to lift 25 per cent easier and operate fifty per cent quicker than any other single lift-truck of equal lift on the market. In addition, it will lift the load with a single stroke of the handle and from an angle.

The exclusive features of the Red Junior Barrett include the spring handle holdup, which prevents the handle from



falling to the floor where some one might trip over it, and at the same time, takes the weight of the handle out of the trucker's hands. All he has to do is exert his energy in pulling instead of carrying a heavy handle around. Other features are: roller bearing latch catch which never wears out and is always positive; automatic engaging latch for lifting loads, eliminating the necessity of stepping on a foot pedal prior to lifting a load. Hyatt roller bearings and Alemite lubricant will be standard.

A Cyclone-Electric Chain Hoist

The Cyclone-Electric chain hoist is designed for that job wherein heavy and continuous loads must be moved quickly, economically, yet with a minimum financial outlay for equipment, for this new hoist is attractively inexpensive, though

possessing the traditional strength and lightning speed of all C-M units. Although higher priced than the hand hoist, the Cyclone-Electric costs considerably less than an electric wire rope hoist of the same capacity.

It is stated that the Cyclone-Electric in scientific tests has proved itself three times faster than the hand hoist. Here is another way to attack that "bottle-neck" of tardy handling. And this speed is actually attained with less labor.

The unusually low head room construction makes the Cyclone-Electric adaptable to many awkward conditions, as does its rotating vertical axis, by means of this it is able to invade the closest quarters. Its perfect balance eliminates unequal stress on the supporting trolley. It is a one man hoist through and through and its light weight makes it convenient for moving from place to place.

New Automatic Saw Sharpener

Samuel C. Rogers & Co., Buffalo, N. Y., has just placed on the market a new full automatic circular cross cut and rip saw sharpener.

This machine known as No. 4 is of extremely simple construction. It embodies five new features: (1) ball bearing grinding wheel spindle; (2) metal cabinet enclosing all working parts; (3) automatic jointing device for keeping saw teeth in perfect alignment and the saw round and true; (4) positive adjustments for maintaining the same degree of bevel during the entire length of grinding; (5) full automatic for cross cut saws with bevel faced teeth up to 40 degrees bevel as well as for rip saws.

The main frame, pulleys, chuck, etc., are of cast iron. The cabinet is of heavy sheet metal. All cams, gears and wearing parts are hardened. The grinding wheel spindle is mounted on ball bearings. In the housing adjacent to the grinding wheel a deep groove heavy duty spindle bearing is used which eliminates end play. In the other housing a self-aligning deep groove bearing is used which automatically compensates for any slight misalignment.

Its capacity is for saws from 3 to 30 inches in diameter with teeth from 10 points to the inch up to 2¼ in. teeth spacing. The grinding speed is at the rate of from 30 to 40 teeth per minute depending on the size of teeth. Once started, no further attention is required. It can also be operated as a hand machine.

It can be furnished for belt drive with tight and loose pulleys or with ⅓ hp. single phase motor to operate from lamp socket of light current. Three 6-in. diameter saw gumming wheels are furnished with each machine. Floor space 20 x 20 in. and 30 in. high. Shipping weight 300 lbs.

Beating and the Vertical Hydrator[1]

By P. E. HODGDON
The Vertical Hydrator Company, Chicago

THE purpose of this paper is to describe the construction and operation of the Vertical Hydrator. It is also intended to take up certain phases of beating and strength development.

Description of the Vertical Hydrator

The Hydrator consists of ten discs mounted on a vertical shaft. These discs revolve at three hundred revolutions per minute, between ten stationary sections. The movable discs have fifty-nine tapering bars nine inches long, tapering from five-eighths of an inch to seven-eighths of an inch at the outer edge of the disc. The stationary sections have fifty-two similar bars. The machine itself stands approximately thirteen feet high and three feet in diameter. The clearance between the discs is adjustable by means of a screw thrust adjustment on the bottom bearing of the vertical shaft. These bars do not touch each other but can be adjusted to .001 of an inch clearance.

The stock being treated is pumped to the top of the Hydrator and is carried down through the machine by centrifugal force and gravity. It may discharge by gravity into a tank or it may be directly connected to a jordan or pump. The Hydrator has a capacity of from three to four tons an hour and when operating under this condition will use between

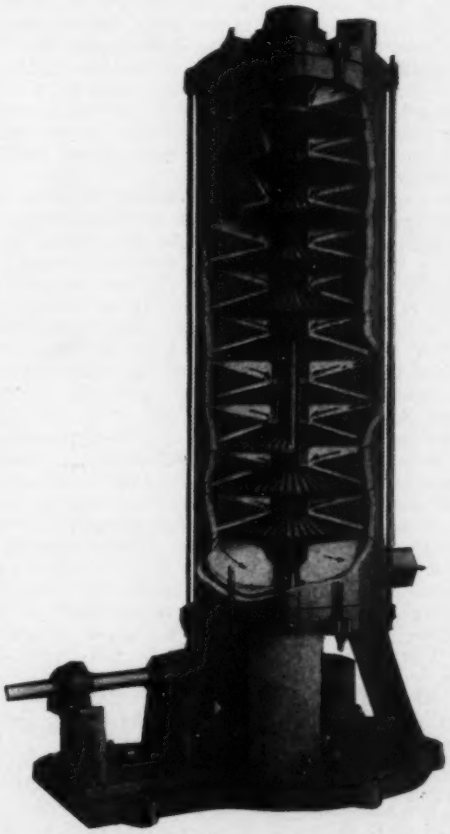
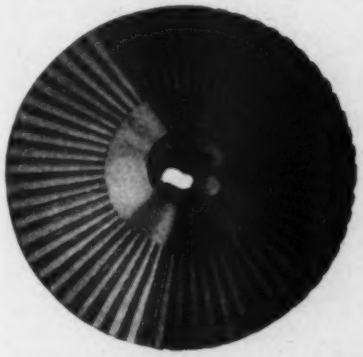


Fig. 1—Illustrating working principle of the Fritz Vertical Hydrator

one hundred and one hundred and twenty-five horsepower, which will result in a strength increase of from twenty to forty per cent upon one passage through the machine; the amount depending upon the kind and nature of stock being treated.

This low power consumption is explained by analyzing the consumption of power in an ordinary type of beater. In the Hydrator, all of the power is productive power. By that, I mean it is actually doing work on the fiber and is not being wasted for circulation, whereas, from tests we find, for example, that a high speed beater, running empty takes fourteen horsepower, and while running full, with the roll up, seventy



At the left is shown the moving disc. There are ten pairs like this in each hydrator

At the bottom is shown a stationary segment of the Fritz Hydrator. Opposite the bars on the face, move bars on a whirling disc, scientifically designed to brush out and hydrate the fibers

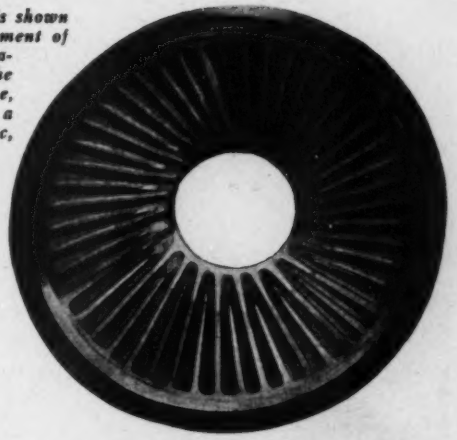


Fig. 2—Moving disc and stationary segment of the Fritz Vertical Hydrator

horsepower; with the roll down, eight horsepower. The difference between fourteen and seventy, or fifty-six horsepower, is then doing very little work on the stock, as the roll is way up. This gives us a very good idea of the non-productive power used for circulating the stock in the ordinary beater.

The action of the Hydrator is entirely a brushing and rubbing effect. The numerical factor of a beater is equal to the inch cuts per minute divided by the square inches of wet beating effect, the wet beating effect being the rubbing or brushing effect. When we compare the Vertical Hydrator with the usual type of beater equipped with metal tackle, we find that the Hydrator has twelve 12.8 times more wet beating effect.

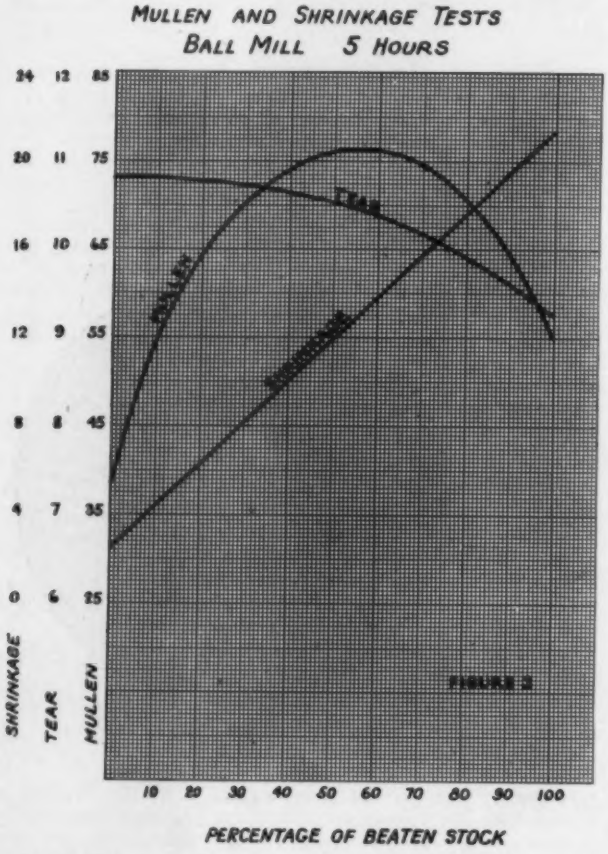
Method of Installation

It is possible to obtain very beneficial results by the following methods of installation: Where a pulp mill is in connection with a paper mill, we have found that it is possible to treat all of the stock going to the different machines, thereby eliminating a large number of the usual type of beaters and in some cases 50 per cent of their jordaning capacity. The elimination of jordaning was possible, for it has been found that a good formation can be obtained with a much longer fiber with stock treated by the Vertical Hydrator. This, of course, results in a paper of better folding and tearing strength and saves a considerable amount of power without the usual loss of bursting strength. In fact, in every in-

[1] Read at meeting of the Miami Valley Division of the American Paper and Pulp Association, in Middletown, Ohio, January 11, 1930.

stallation, we have found that the saving in power alone will pay for the Hydrator in one year.

In other cases, where it is desirable to treat the complete furnish, which consists of different kinds of pulp, we have found that very beneficial results can be obtained by placing the Hydrator after the mixing beaters and before the jordan. In this case, I have reference to papers made from a mixture of groundwood and sulphite, old paper stock and sulphite or sulphite and soda pulp. A two-fold advantage is obtained by such installation: first, the increased tear and general strength qualities; secondly, it has been found that it is possible to cut the percentage of the stronger element which in the above cases would be sulphite. This is due to the fact that the sulphite used is in itself stronger and at the same time uniformly



mixed with the weaker fibers, so that the reinforcing effect might be compared with the reinforcing in concrete, which, as we all know, is uniformly spaced to obtain the maximum results of any given reinforcing material.

We know that the strength testing apparatus gives us a strength reading equal to the weakest part of the sheet being tested, for this of course is the part of the sheet which will break first. The tremendous brushing and mixing effect of the Hydrator is responsible for this uniformly well formed sheet.

In cases where the capacity of the Hydrator is greater than is necessary, it has been found that it is possible to run the Hydrator up to capacity by passing the fraction of stock not needed back to the feed chest. At first this may seem strange but when we stop to consider the fact, that after stock has been passed through the Hydrator as many as four times, the fibers are 10 per cent longer than stock beaten in the usual type of beater for only one hour and a half, it can be understood why this is possible. It might be well to add here that stock treated in the usual type beater for an hour and a half will increase in strength approximately 25 per cent, whereas stock treated through the Hydrator four times will increase in strength 51 per cent and yet be 10 per cent longer.

Beating and Hydration

As already stated, the Hydrator develops strength without the usual loss in length of fiber. Just how important this length of fiber is in strength development can be seen from the following facts in connection with beating and hydration.

Hydration

When technical control and the freeness tester began to play an important part in papermaking the term "hydration" did not belong to the vocabulary of the practical papermaker. We find that today even beater engineers are using the term in a matter-of-fact way, which would lead one to believe they really know what it is. In fact, the word is used in so many different ways it means very little. It was introduced into the language of paper technologists by the chemist who sought to apply a more scientific descriptive term to the papermaker's expression of "wetness" or "slowness." The meaning of the latter words as descriptive terms is quite clear, "wetness" referring to the retention of water and "slowness" to the reluctance to part with water, both describing the behavior of the stock on the machine wire.

The scientific term, "hydration" unfortunately is not so conscise in its descriptive meaning, having both chemical and physical definitions.

To the average technical man, "hydration" means literally "a union with water" and does not necessarily mean a change in length or other physical alterations of the fiber other than perhaps the swelling of the fiber as it takes on water. Just how this union with water exists we do not know. Some are of the opinion that it is chemically combined, while others claim that it is only mechanically held by the fibers. The writer is inclined to believe in the latter theory; hovewer, it is not planned to go into a lengthy discussion of the different theories at this time. We point this out to show that when we talk of hydration in this sense of the word we are talking about something we do not know a great deal about. It is, however, intended to show the effect of this combination of cellulose and water upon strength development, and on the many actions of paper in general.

To the average papermaker, hydration, cellulose hydrate and hydrating simply mean strength development and a good sheet of paper. As already stated, the above terms have been adopted by him to represent wet, softened or slimy stock. Going further, it is apparent that this wet or slimy condition is in reality only an indication of the changes in the physical state of the fibers, that necessarily take place while the beating process is being carried on. In other words, it resembles a thermometer but instead of measuring temperature it measures the changes that take place in the fiber structure. For example, we know that if we beat pulp one hour with the roll in a certain position, we develop a certain amount of this slime and do a certain amount of cutting and brushing out; in two hours we will have developed more slime and done more cutting and brushing, so it can be seen that this slime development is in a way an indication of work we have done on the fiber. Let us bear in mind that as we are beating the fiber in the presence of water, we cannot prevent the cellulose from absorbing or taking on this water which in turn causes the pulp to acquire this "slimy feel."

When the beater man "feels" of the stock in order to determine how the beating is progressing, his fingers are not sensitive enough to enable him to estimate the small changes in physical state of the fiber, but as he "feels" and squeezes the pulp, the difference in slime is more readily noticed, so that naturally this is what he uses as a guide.

As already stated, this slime is an indication of work being done on the fiber, but what kind of work has been done is still more or less a mystery until the stock is made into a sheet of paper. In other words, a certain amount of slime or water combination with cellulose may be developed in a given time in a beater on two very different kinds of pulp, whereas the amount of cutting and brushing done might vary a great deal.

Effects of Beating on Strength of Fiber

It is apparent from the following data that the physical changes that take place in the fiber during beating, such as change in length and degree of fibrillation, are very important in strength development, so that if the "feel test" is largely

a measure of the degree of slipperiness or combination with water, which, as already stated, we cannot prevent, it is very possible that we will be misled in judging the quality of paper that will result from a certain treatment.

Water plays a greater part in strength development than any other one thing, regardless of what kind of equipment is used in beating. We use it because we cannot develop the latent strength of the fibers without the softening and pliability that results when the two come in contact. The importance of the latter effect is demonstrated when pulp is beaten in alcohol which does not have a softening effect. It is found that by such a treatment, it is impossible to develop strength, for even with a light brushing of the roll, the stiff, brittle fibers are cut and broken so that the resulting sheets are soft and could only be called paper by courtesy.

At the start of beating, the fibers are more or less pliable but as the beating progresses, they become softer and acquire a greasy or slippery feel as more water is taken on by the fibers. They may be compared with hollow tubes, the walls of which are built up of several layers and consist of small fibrillae.

When examined with a high-powered microscope, these fibrillae are shown to be very small in diameter, crossing and interwinding each other over the length of the fiber. Between these different layers of fibrillae are very minute spaces or pores.

During the beating, the brushing action separates and raises the fibrillae which in turn liberates any air which might be held in the pores between the different fibrillae, thereby exposing a much greater area of cellulose to water present and the result is a further softening and wetting effect. During the absorption of water by the fiber we are at the same time making other changes in the shape and general physical characteristics of the fiber. The combination of these different effects gives us paper of certain strength and character.

There are a great many factors that effect the rate and maximum strength development that can be obtained in a given beater in any given time. For example, the number and width of the roll and bed plate bars, speed of the roll, density of stock being treated and the weight of the roll. All these effect the results obtained.

Before deciding upon what kind of beating equipment we should use, it is advisable to first analyze what we wish to accomplish. We know that a certain bursting strength, for instance, is the result of certain treatment but we have never been able to say with any certainty how much of the total strength is due to the different factors such as so-called hydration, flexibility, length of fiber and brushing or blooming action.

A Beating Experiment

The importance of absorbed water, raising of fibrillae and fiber length is shown by the following interesting experiment:

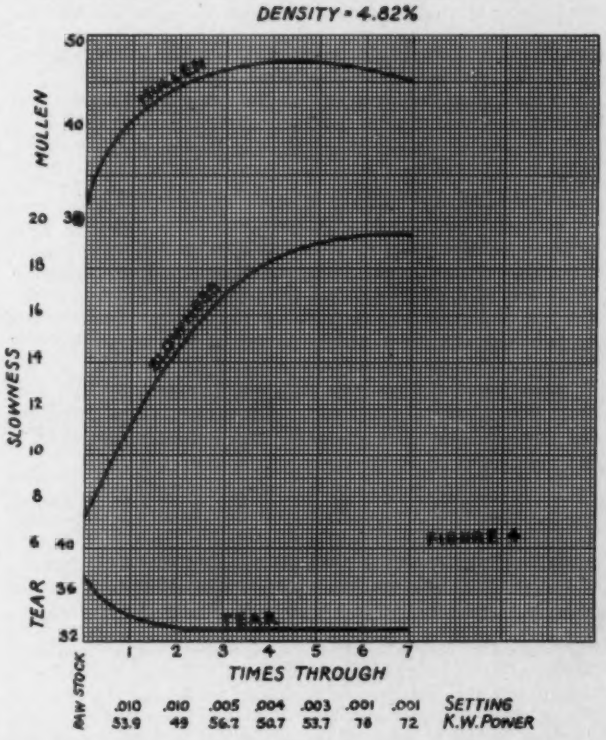
Sulphite stock was first placed in a ball mill and beaten for five hours. During this time, the fibers were broken up into fine fibers and fibrillae having an average length of 0.437 mm. and were to all practical purposes thoroughly saturated with water so that the resulting pulp resembled a jelly that would pass through a 65-mesh wire. Different percentages ranging from 5 to 95 per cent of this "mush" having a bursting strength of 55 were mixed with raw unbeaten pulp having a fiber length of 1.375 mm. and bursting strength of 38. Sheets were made of these different combinations in the usual manner with the results as shown in Figure 3. It will be seen that it is possible to obtain a strength of 76 from a mixture of two pulps, the stronger of which only tested 55. This shows that so-called hydration is not strong in itself and not all we are after and that we must maintain fiber length if we wish to approach anywhere near the ideal maximum strength which it is possible to obtain from any given pulp.

From Figure 3 it will be seen that if it was possible to treat the fibers in such a way as to duplicate the combination we have at 35 per cent that we would be able to double the bursting strength without decreasing the tearing strength appreciably. For mill operation it would not be practical to mix stocks in such a manner, so that in order to approach this ideal strength development, we must submit the fibers to such treatment that will not break up or subdivide the fibers but will soften and raise the fibrillae which in turn will imbibe or absorb water and become soft and pliable. Fibers in this condition when pressed together unite closely. The fibrillae, acting like fingers, reach out and grasp their neighbors so that a strong densely interwoven sheet results. Here again we see the importance of the softening effect of water in strength development, the plastic fibrillated surfaces being pressed into very much closer proximity than would be the case if they were stiff and brittle.

During the drying, as the absorbed water leaves the fibers, they shrink and contract so that the different fibers are pulled still closer together and the surface of each individual fiber becomes more dense than the original unbeaten porous fiber. This latter effect explains in part why it is so hard to develop strength when beating broke.

We have all often heard and spoken of the "time element" in beating. By this we mean that in order to get a sheet

CURVES SHOWING RESULTS OBTAINED BY PASSING SPRUCE SULPHITE THROUGH HYDRATOR SEVEN TIMES



having a good bursting strength and at the same time good tear, tensile and porosity, we must take plenty of time and subject the stock to a very slow drawing and brushing out which, of course, consumes time and power. In talking of the usual type of beater, the above is perfectly true, for such treatment will limit the fibrillation to the surface layers of the fiber, while the main structure of the fiber is preserved. If we try to hurry the treatment, a loss in tear and length of fiber results. The Fritz Vertical Hydrator is the only machine on the market at the present time that enables us to approach the desired results in an economic way and in which the "time element" is not as necessary.

It is evident from the foregoing that the interfibrous colloidal or slippery material does not, as some people feel, act as a cementing material such as starch and is not the sole or even principal cause of the strength of beater stock. We know, for example, that pulp beaten in a ball mill or beater increases in strength up to a certain point and then falls off, although the wetting and so-called hydration continues to increase. It is not intended to disregard the importance of water combination, and the formation of this colloid, but to value its importance correctly. Stock passing

through the Hydrator 4 times and increasing in strength 51 per cent, does not feel as slippery as ordinary beater stock, beaten for 1½ hours and only developing in strength 25 per cent. A further indication of the importance of maintaining fiber length is shown when two batches of pulp are treated in the following manner:

It was found that, regardless of how stock was treated in the regular type of beater, the best maximum bursting strength it was possible to obtain was 43. On the other hand, by passing some of the same stock through the Hydrator a number of times, a maximum strength increase of 53 was obtained. In other words, in the ordinary treatment we break down the fiber before all of the latent strength has been developed. The fact that we do not break the fiber down during the treatment in the Vertical Hydrator is shown by the tear curve in Figure 4. Although this curve shows a slow drop in tear, it is nowhere near as great as that which takes place for the same bursting strength development in the usual beater, for it is a well-known fact that in the majority of cases it is necessary to sacrifice tear in order to develop bursting strength. It will be noticed that after the second time through, the tearing strength remains the same. The slowness also increases. This is, however, not due to shorter fibers as is usually the case, but is due to proper fibrillation and imbibition.

It is a well known fact that stock can be damaged in the ordinary type of beater if not handled properly. The Vertical Hydrator is fool proof in this respect. The adjustment of the movable sections, of which there are ten, can be made easily but it is impossible to have the bars touching, so that no great cutting action or damage to the fibers can be done. The fact that the Hydrator operates continuously eliminates the frequent setting of the roll as is necessary in the usual type. This latter point is in itself very helpful as it eliminates any variation which might occur from a different setting during the batch method of beating. Knowing how difficult it is to set the roll of the usual type of beater in the same place each time, the importance of the above points can be readily seen.

Freeness Testers

There are several freeness testers on the market. They are, however, all the same in principle, namely, that they measure the rate of drainage of water away from a thin mixture of stock and water.

We find that in talking with some men they use the freeness tester to control hydration and strength development during the beating and jordaning. When we consider what a freeness tester really measures we will all agree that it is not a measure of any one thing but a combination of various factors.

In the first place, we know that it is possible to treat two batches of stock in such a way that we will have a freeness of, say, 200, in both cases and yet the paper made will have quite the opposite characteristics. A freeness tester measures length of fiber, brushing or degree of fibrillation, flexibility or felting quality, absorbed or combined water and the effect of sizing and loading materials. Just what percentage of the reading is due to each of the individual factors, we do not know, so that it can be safely said that any freeness reading is not necessarily an indication of what treatment we should use to improve any particular quality in our finished sheet.

The above has been given to show that unless we fully understand what a freeness tester measures it is very apt to mislead us, and, in some cases, get us into trouble. Take, for example, a beater engineer who is held responsible for a certain freeness of stock to the machines. He can, of course, vary his beating within certain limits, but when these limits are reached and he is pushed for stock, he meets the condition by furnishing fine stuff which gives the correct freeness but imparts very different qualities to the paper. In this case, quality is sacrificed to maintain a certain freeness.

Further, unreliability of the freeness testers is shown by the effect of sizing. For example, when the rosin emulsion is precipitated by alum in the beater, a sudden increase in slowness of from thirty to forty per cent results, while at the same time a drop in strength of from ten to fifteen per cent takes place. Here we find the increase in slowness to indicate a decrease in strength which is quite contrary to the average interpretation of such an increase. This decrease in strength is not due to any chemical change or reaction but is due to a change in the physical condition of the beaten fibers. This is proven by a corresponding increase in strength when the rosin is extracted from the fibers. It is apparent then that the rosin lays and holds the fibrillae down in such a way that the fiber reverts back to its unbeaten physical state. Here again, we see the importance of proper brushing action during the beating if good strength is to be desired.

Results Obtained on Different Woods

As has already been shown, the action of the Fritz Vertical Hydrator is largely a brushing action but as an ounce of practice is worth a pound of theory let us see what has actually been accomplished.

Bleached hemlock sulphite is materially more brittle than spruce and previous to the use of the Vertical Hydrator it was impossible to develop a strength anywhere near equal to that of spruce so that in cases where strength was necessary, spruce sulphite had to be used. It is now possible, owing to the large difference in treatment the stock receives, to use hemlock and develop strength suitable for the average paper. This, of course, means a saving of from four to six dollars a ton on wood costs as hemlock is much cheaper. A strength increase of from 20 to 30 per cent results when passing 8,000 pounds of stock per hour through the Hydrator.

Hemlock or spruce kraft stock develops strength very rapidly when treated in the Hydrator. It is possible to get as high as 40 per cent increase in bursting and tensile strength by one passage through this machine. As this type of fiber is very strong and harsh while hemlock sulphite is quite the opposite, it is apparent that any fibrous stock coming within these two extremes should be treated with equally as good results.

Corrosion Resisting Alloys for Pulp and Paper Mills*

By WALTER M. MITCHELL
Central Alloy Steel Corporation, Massillon, Ohio

THE selection of metals for the construction of plant equipment for use in handling corrosive materials is a problem affecting many processes and is always one of extreme importance. In a way it is a kind of perpetual problem, for with the development of each new process it must be solved all over again before the process can become a commercial success. When chemical industries were in their infancy and relatively small units of equipment sufficed the question of materials of construction was more easily solved. Conditions where corrosion was extreme could be satisfied by stoneware and other vitreous materials. But with the inception of large scale production and the development of the newer synthetic processes the situation has become more acute and vitreous or similar materials are found no longer to possess the strength and toughness required.

The demands of chemical industries have been a powerful stimulus to the metallurgist, who, we are glad to say, has been able to respond promptly and has produced metals which in numerous instances have fulfilled virtually all requirements. The success of high nickel-chrome steels for ammonia synthesis and the stainless irons for manufacture of nitric acid are well-known instances of this. These metals have revolutionized the manufacturing processes for those products. In other cases, however, the metallurgist has not been so successful and there are many demands of chemical industries not yet satisfied.

Each alloy developed has its own field of usefulness beyond which its use is not recommended. One inconvenient feature is that high resistance to corrosion frequently goes hand in hand with undesirable mechanical qualities; so that, while an alloy may be very good in one respect, it is not so good in another. In such cases a compromise is necessary, resulting either in sacrifice of corrosion resistance or the willingness to carry on with equipment designed to satisfy the idiosyncrasies of the metal rather than the plans of the designing engineer. It is rarely that a pure metal is capable of fulfilling all requirements. This is very apparent when the de-

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 19, 1930.

mands of chemical industries are considered. In consequence, an extraordinary number of combinations of metals has been produced with the hope of developing something that will meet in a satisfactory manner at least some of the requirements.

Combinations of metals can be very widely, but sharply, divided into two classes: The true alloys, that is, those forming solid solutions in which free metallographic constituents do not appear; and those in which free constituents, such as carbides, eutectics, intermetallic compounds, etc. are present.

Corrosion Phenomena

Just what the actual mechanism of corrosion is appears still very much a subject for discussion. In the case of a pure metal it may be regarded as a result of what may be called the "unsatisfied affinity" of its atoms for the stranger atoms of some other substance, and this determines the energy with which it will combine with this substance, generally displacing some other element with which the stranger atoms have previously been in combination. If it is possible to reduce this unsatisfied affinity that which we call corrosive attack will be diminished. This may be done, as in the formation of an alloy, by the addition of some other metal, usually less reactive, which forms a solid solution with the first. In such case susceptibility to attack will be considerably reduced. If this energy of affinity is still further reduced by the addition of a third metal in the solid solution there will be still greater resistance to attack, and so on.

This is well illustrated by a number of alloys. Iron is readily attacked by oxygen, even at normal temperatures. The addition of chromium, which forms a solid solution, as in stainless irons, produces practically complete resistance at ordinary temperatures and even at moderately elevated temperatures. If a third metal, such as nickel or silicon, is added in proper proportion, which also enters solution with the iron and chromium, resistance to oxidation is extended to still higher temperatures, and the alloy is unattacked by a number of materials, which attack both the plain iron and the iron chromium alloy.

It is now well recognized that the solid solution type of alloy is not only inherently more corrosion resisting, but is also better from the mechanical standpoint, for such alloys almost invariably possess the highest physical properties of strength and toughness of any alloy of the series.

In the second group of alloys, which are merely mechanical mixtures of the various constituents, action due to potential differences will take place between the constituents themselves, and in consequence this type of alloy is not the most desirable for corrosion resisting purposes.

Considering metals and alloys as a whole, the character of resistance to attack is dependent very largely on the inherent chemical affinity of the metal, or perhaps better, the reciprocal of the affinity, the inertness to certain other elements, the most important of which are oxygen, sulphur, and the halogens, and upon the degree to which this inertness may be increased by admixture of other alloying metals. Thus, in a metal inherently resistant to acids, resistance will be increased by the addition of silicon; and similarly, increased resistance to oxidation will be obtained by additions of chromium, and so on. In alloys used in manufacture of sulphite pulp we have seen illustrations of this in applications of the metal lead. Lead is resistant to sulphur dioxide and is found to notably increase resistance of bronzes to which it is added in increased proportions. In any case, however, the useful combinations which may actually be produced are limited by the solid solution forming ability of the metals themselves.

In addition to the characteristics of the metal itself other factors profoundly influence corrosion attack. These may be classed as contributing causes and include temperature, rate of agitation, oxygen content, formation of protective films, etc. These factors are closely dependent one on the other, and the degree to which any one enters will readily be affected by the influence of some other. Such interdependence accounts for the complexity of the corrosion problem, and explains the difficulty of tracing through to their ultimate causes definite cases of corrosive attack.

Corrosion in Paper Mills

In the various phases of the manufacture of pulp and paper, the chief field for corrosion resistant alloys is for equipment for manufacture of sulphite pulp. Other pulp processes and the manufacture of paper itself appear to be comparatively free from unusual difficulties because of corrosive attack. Metals and alloys employed in the manufacture of sulphite pulp are lead, copper, copper alloys, such as bronzes, etc., chrome-nickel, and chrome-nickel-molybdenum stainless alloys.

Lead, as is well-known, is used for coolers for sulphur dioxide and appears to give satisfactory service. It has the advantage of being low in cost and is easily fabricated. Bronzes are used chiefly as castings for pipe fittings, valves, nozzles, strainers, etc. The use of bronzes has been established because of the good quality of castings obtainable and because it has fair resistance to sulphurous acid, at least better than many other metals. Compositions, as far as it has been possible to ascertain, vary from the familiar 85:10:5 to high lead bronzes with 70% Cu, 5½% Sn, 5½% Sb, and 19% Pb. Another composition in considerable repute is 90% Cu, 9½% Sn, ½% P. Both antimony and lead are desirable additions and increase resistance to sulphurous acid, although the addition of a high percentage of lead is accompanied by increased casting difficulties. Bronze castings show a life of a few weeks to a year depending upon analyses and service conditions.

Copper tubing 6 inch extra heavy I. P. S. is used extensively in Canada for acid supply lines. It does not appear to be particularly satisfactory as it seldom lasts longer than a year.

Chromium Alloys

The most interesting alloys for use in the manufacture of sulphite pulp are the chrome-nickel and chrome-nickel-molybdenum alloys produced under Krupp-Nirosta patents and generously classed with the stainless irons and steels. Chrome-nickel alloys of the 18-8 type, such as Enduro KA2 and Allegheny metal are considerably more resistant than bronzes and are reported as giving at least twice the life of bronze; but as bronze analyses are not specified this is rather an indefinite recommendation. At all events it appears unquestionable that the chrome-nickel alloy is distinctly the better metal. The 18-8 composition appears to be generally satisfactory for cold sulphur dioxide and sulphurous acid, but if resistance at elevated temperatures is desired molybdenum must be added. From all information available to the writer the chrome-nickel-molybdenum combination 18-8-3, such as Krupp's V-4-A or its American equivalent, Enduro KA4 is entirely satisfactory from the corrosion resisting standpoint. This alloy as manufactured in Germany and duplicated in the United States has been tested in numerous plants and all reports on its service are satisfactory. It is a workable metal and has been produced in virtually all forms, as castings, sheets, plates, bars, seamless drawn tubing, etc.

Metallurgically considered the chrome-nickel and chrome-nickel-molybdenum stainless alloys of this type are all austenitic. To the metallurgist this pictures an alloy of the solid solution type with no capacity for hardening by heat treatment, hardening being produced by cold mechanical working only, high toughness and ductility, and the property of being non-magnetic.

To put alloys of this type into best mechanical condition and to insure greatest corrosion resistance; that is, to make them fully austenitic, they must be heat treated by heating to a high temperature, 1900 to 2100 de. Fahr. for the chrome-nickel, and 2000 to 2200 deg. Fahr. for the chrome-nickel-molybdenum, and cooled rapidly.

The chrome-nickel-molybdenum alloy, such as Enduro KA4, shows physical properties closely similar to the 18-8 analysis, as would be expected. Physical properties of heat treated bar stock are as follows:

Tensile strength	86,000 pounds per square inch
Yield point	42,000 pounds per square inch
Elongation in 2 inches..	62 per cent
Reduction of area	70 per cent
Brinell	140 to 153

Izod ..... 113 to 115 foot pounds

Considerable variation in carbon content may be found in commercial varieties of these alloys, which may run as high as .20 or .25 per cent. This is not particularly desirable as higher carbon results in greater precipitation of carbides at temperatures of 1300 deg. Fahr. to higher, resulting in lessened ductility, This will be emphasized if the metal is in condition of mechanical strain when heated.

The chrome-nickel-molybdenum analysis appears to show re-crystallization at 1800 to 1900 deg. Fahr. with absorpton of carbides becoming more or less complete at about 2000 deg. Fahr. At higher temperatures, that is at 2300 deg. Fahr., secondary crystallization appears to take place with greatly increased grain growth. So far, insufficient experimental work has been done on this alloy in this country to state the above recorded data to be facts; all that can be said at present is that such appears to be the case. It should be noted that we are dealing with a very complex alloy, containing in addition to the original iron, important percentages of chromium, nickel, and molybdenum. the variation of any one, or several, of which elements will undoubtedly be accompanied by variations in metallurgical characteristics, the effects of variations in carbon being particularly pronounced.

Fabrication Factors

Just how great this effect will be and to what extent the usefulness of the metal will be altered will depend upon methods used for fabrication, whether welding or riveting. Welding is obviously the more convenient and more suitable for fabrication of smaller and more intricate pieces of equipment. Either the electric arc or acetylene process may be used, rods being of the same composition. Riveting has some advantages over welding, particularly where heavy plates are to be joined and where corrosion resistance and strength are concerned.

In welding, it has been our experience that alloys of this general character are more liable to failure by cracking if carbon content is high than if low, this is doubtless due to decreased ductility through precipitation of carbides in heating and a condition of strain induced through thermal expansion and contraction. Heat treatment should always follow welding. This is particularly important if the metal is high in carbon.

As these metals become hardened by "cold work" at temperatures of 1700 deg. Fahr. or less, it is important that rivets be driven sufficiently hot for upsetting to be completed before the rivet becomes cold worked to any degree. There is probably no test other than a destructive test that may be used to investigate welds, rivets, etc. to determine whether or not the metal is in safe condition. The only assurance in such cases is to observe proper fabrication methods.

In parts which do not require extensive fabrication the alloy V4A or KA4 may be used without hesitation. Valve stems, for instance, may be produced from bar stock. In installing these it is advisable to avoid contact with copper alloys or with graphite because of electrolytic action which is likely to take place at the expense of the chromium alloy.

In producing castings, it is necessary to raise the carbon content somewhat in order to produce a sounder metal. As a rule, highly alloyed ferrous metals are difficult to cast satisfactorily if carbon content is maintained low. If carbon is too high, however, corrosion resistance may be affected and the alloy becomes so hard that it is impossible to machine it. Thus, the necessity for holding carbon as low as is consistent with the production of sound castings. Even at best a coarse open grained structure is likely to result. The large coefficient of expansion tends toward piping and cracks so that the mechanical quality of castings leaves much to be desired. Being austenitic these alloys cannot be heat treated as ordinary carbon steel. In consequence the original casting structure cannot be eliminated by any means other than mechanical working. Proper foundry practice and pouring temperatures are very important and castings of at least fair quality should be obtainable without great difficulty.

If it is possible to produce the desired part by forging, this is preferable, as a forging properly made and heat treated will have far better crystalline structure and physical properties than any casting.

Sheets, Plates and Tubes

Sheets and plates are produced in ordinary sizes without difficulty and are of good quality. They are suitable for blow-pit bottoms, screen plates, etc. The question of perforation is still a little uncertain, but it is believed that this can be successfully done. Such bottoms should be free from the objections of perforated wood or tile bottoms. They should not only withstand corrosion but erosion by the pulp as well.

Seamless drawn tubing for acid lines is available in the KA4 analysis in sizes up to 5 inches I. P. S. Larger tubing must at present be fabricated by welding sheets or plates together. Piping over 10 inches in diameter may be riveted. Tubing of straight chromium analysis fabricated in this way is being used for nitric acid manufacture and is giving excellent service.

As the chrome-nickel-molybdenum analysis is so satisfactory from the corrosion resisting standpoint, and as tubing is available, it should be possible to develop heat exchangers whereby the heat of relief steam would be utilized to preheat acid before its introduction into the digester. It is believed that considerable economy in operation would result from installation of suitably designed equipment of this character. In addition the problem of disposal of waste liquors in thickly settled communities would be considerably simplified by construction of evaporators made of KA4 tubing.

Seamless drawn tubing should be expanded for Van Stone joints and subsequently heat treated. Flanges which are welded should also be heat treated. If the carbon content is low, heat treating one end of a tube will not injure the balance of it.

Centrifugal Castings

Centrifugally cast tubing of large size is a commercial possibility in the near future. Bronzes, cast iron, monel metal, etc., have been successfully cast in tube form by this method and there appears no reason why chrome-nickel-molybdenum alloys cannot be similarly handled. The structure and physical properties of centrifugally cast metal are notably better than in still castings. Sizes in bronze tubing have run up to 24 inches diameter and 20 feet long. It may also be possible to cast flanges integral with the tube itself thus doing away with welding or expanding. Tubing of this character will be very suitable for blow lines, and should give much longer life than the cast iron pipe now in use.

Digester Construction

The fabrictaion of a full size digester of chrome nickel molybdenum alloy is not an impossibility. Riveting is to be preferred to welding as a means of construction because of the obvious impossibility of heat treating any piece of equipment the size of a digester after fabrication. To avoid questionable quality in the metal itself and possible undesirable results of fabricating procedure, very low carbon should be specified for both plates and rivets. Further, both the plates and the rivet material should be heat treated before fabrication. The chief advantages of an alloy digester will be the material reduction in corrosion troubles and the elimination of the brick lining.

Electric Machinery Mfg. Co., Minneapolis, has recently received from Maine Seaboard Paper Co., of Augusta, Maine, an order for five 3,500 hp. synchronous motors for driving pulp grinders, and two 150 kw. synchronous motor generator sets. Each grinder motor runs at 240 r.p.m., and will operate on a 6,600 volt circuit at leading power factor so as to assist in correcting the plant power factor. By means of double shaft extenions, each grinder motor will drive two Waterous hydraulic magazine grinders. The two synchronous motor generator sets will be used to supply the 250 volt excitation to the grinder motors.

It is reported that the merger of B. F. Goodrich Rubber Co. with the Miller Rubber Company has been approved by the stockholders. Under terms of the merger, Goodrich Company assumes all the assets and liabilities of the Miller Company in exchange for 113,504 shares of Goodrich common stock.

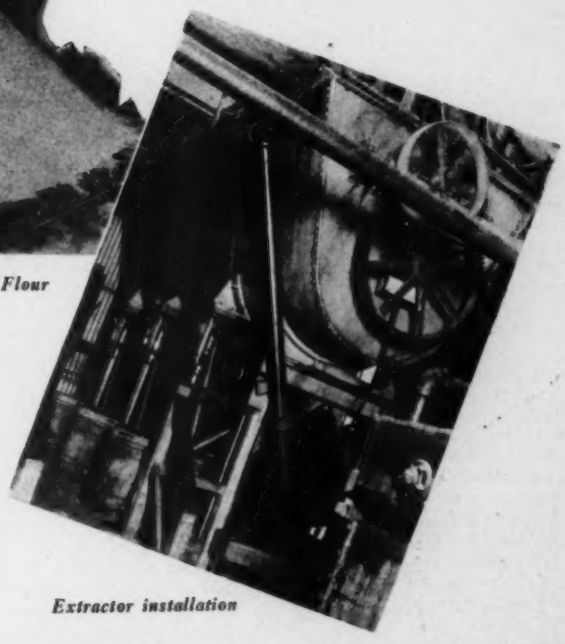
Putting By-Products of By-Products to Work

Utilizing the by-product of a by-product, The Celotex Company, Chicago, is now recovering 15,000 pounds of bagasse flour a day and selling this mainly to the leading manufacturers of explosives for use as a powder base. Bagasse flour has found favor with these manufacturers because of its porous character and its low density.

Until recently the bagasse flour was a valueless by-product that occurred in the making of Celotex, the insulating building board manufactured from bagasse, which itself was formerly a practically unutilized by-product. About nine years ago, however, The Celotex Company began the manufacture of its insulating board, making it from bagasse, the fibers of the sugar cane after the juice has been extracted. Now the Celotex Co. mills have an annual capacity of 500,000,000 square feet.

Bagging flour

Pile of Bagasse Flour



Extractor installation

Always alert to the diversifications present in the manufacture of Celotex, the research department worked out a process to reclaim the flour, and set up in the Celotex factory at Marrero, Louisiana, a plant for the recovery of the pith of the cane fiber while the bagasse is being macerated into a pulp. Little more than an hour is required for the converting process. Taken by the save-all from the white water, the pith is pressed, dried, and packed into bags.

High Yield in Straw Paper Making[1]

By L. M. BOOTH

President, Booth Chemical, Elizabeth, N. J.

THE prime requisite for corrugating paper is that it shall be suitably stiff, so that when corrugated, the finished box shall be sturdy and at the same time sufficiently resilient to preserve the contents of the package from shock and damage. There are no fixed requirements as to color; different chemical processes naturally produce papers whose colors vary slightly. The present standard straw corrugating paper has a thickness of .009 inch and weighs 34 pounds per 1,000 square feet.

Until lately, straw for making corrugating paper and for strawboard, has been almost universally cooked with lime. Most digesters are of the rotary globe type and are usually 14 feet in diameter. Recently, with a view to enhancing the stiffness of the paper, various combinations of other alkalies, such as sodium carbonate or caustic soda, have come into use as digesting chemicals. Sulphur and its compounds have been used as well. After digestion, the hot wet straw is dumped into the storage pit from which it is withdrawn for the beaters in the paper mill. The next standard procedure involved washing to remove the excess alkali remaining after digestion, as well as most of the non-fibrous substances. Inadvertently some of the fiber was also lost. This wash water constitutes the major item of stream pollution by straw mills. During and following the washing process the stock was beaten, then jordaned, and finally delivered to the paper machine. From time to time various investigators, including technicians of the United States Government, have worked on the problem of disposal of this washer waste. All the efforts seem to have centered around the idea of disposal. In their work, no doubt, the scientists were guided by the papermakers, who at that time, contended that they wanted to be rid of such portions of the straw as they had been accustomed to wasting.

The outstanding difficulty in the way of destructive disposal is the large amount of material concerned. The United States Public Health Bulletin No. 97 (1918) is authority for the statement that the population equivalent for straw mill effluent is 1600 per ton of product. It is therefore apparent that the effluent from a 50 ton mill corresponds with the domestic sewage pollution contributed by a city of 80,000 population.

In 1927, the straw group of the Paperboard Industries Association expressed interest in the development of a process whereby the waste water from straw washing might be disposed of without nuisance to neighbors, especially those located down stream on the water courses carrying the straw mill waste. With the co-operation of this group and through the generosity of one of their members, the Hagar Straw Board & Paper Company, we were afforded the opportunity of demonstrating a new process at Cedarville, Ohio. Our work at Cedarville was undertaken with the idea of utilization instead of disposal. By following this utilization plan, straw paper was produced from the whole straw, i.e., without the loss and waste involved in the washing operation referred to above.

[1]Presented at annual meeting of T.A.P.P.I., Pennsylvania Hotel. New York, N. Y., Feb. 19, 1930.

Application of Chemicals

Successive preliminary runs involved the gradual elimination of washing. The neutralization of the alkali and the coagulation portion of the process was first undertaken by batch application of chemicals in the beaters. Later chemicals were applied continuously. The points of application were changed from time to time, each change being made in order to delay the action of the acid coagulant. The most advantageous point of application was found to be at the flow box of the machine.

When paper was made from washed pulp by the old process, a liberal excess of digestion chemicals was necessary because practically no digestion was contemplated or effected in the beaters. Some of this excess was removed by washing previous to beating. The reason for this was twofold; first, it was necessary to get rid of the alkali and second, because of the difficulty of washing out alkali which had become fixed in the fibers by beating. With the amount of alkali which prevailed, even after washing, precipitate was deposited on wires and felts. Unless the pulp was very thoroughly washed, the paper became softened during storage, due to the action of the alkali which it contained.

In the new process, smaller amounts of cooking chemicals are used, resulting in less drastic action on the straw. The hot straw, carrying the smaller residue of alkali from the rotaries, is delivered to the beaters. Washing is eliminated entirely, or materially reduced. The digestion process still continues at beater dilution. The stock is easily defibered at the prevailing higher temperature and in the presence of alkali. This procedure requires less time and less power than that with the old process and at the same time, long, tough fiber is produced. No troublesome solids are deposited, which require frequent souring of machine wires and felts, because the small amount of excess alkali is neutralized just prior to the delivery of the stock to the machine. When no alkali is present in the finished paper it retains its characteristic stiffness.

Chlorinated Copperas Coagulant

One suitable coagulant for neutralizing alkali is chlorinated copperas, a combination of ferric sulphate and ferric chloride. This may be cheaply prepared by the use of a solution feed chlorinator, together with a dry feeder for dispensing the ferrous sulphate. These substances combine chemically in the ratio of 1 part of chlorine to 7.85 parts of ferrous sulphate. Since straw pulp is readily decomposable, more chlorine than that shown in the above ratio is used in actual practice. This excess chlorine plays an important part in arresting decomposition and preventing the formation of slime. Straw paper made from unwashed straw has been successfully made by the application of chlorine alone to the stock at the paper machine. By this use, however, the maximum economy of the process is not attained, since chlorine alone is not a substitute for aluminum or ferric compounds, the coagulating values of which are utilized.

Among the advantages incident to the use of this process are the following:

(a) The chemical action of digestion is less drastic because excessive amounts of chemicals are not required for cooking.

(b) The loss of stock is reduced, depending upon the extent of reduction of the washing.

(c) Coagulation of the stock at the paper machine, retains in the sheet valuable materials which otherwise would be lost. A denser sheet is formed.

(d) Less steam is required for drying due to the fact that the presses squeeze out more of the water at the increased temperature prevailing throughout the system, from the beaters to the machine vat. This advantage is particularly noticeable in winter. The stock remains warm instead of being chilled as occurs when cold water is used for washing.

(e) Acid is rarely needed for souring the wire and felts because of the neutralization of the residual alkali content before the stock is delivered to the paper forming wire.

(f) Stream pollution is decreased depending upon the reduction of stock washing. Ordinarily 15,000, to 25,000 gallons of fresh water are used in the washing of stock required to make a ton of paper or board. If the washing is reduced (or eliminated entirely) the large quantity of water heretofore required for washing does not have to be provided, and the problem of disposal of the corresponding volume of wash water does not have to be considered.

In addition to the various operating economies referred to above, a noticeable increase in the yield results. Savings of from 500 to 900 pounds of straw per ton of paper produced have been reported.

It thus appears that the interest which the straw group of the Paperboard Industries Association displayed in stream purification has resulted in the modification of a time honored manufacturing process by eliminating the most wasteful step, namely, that of washing, which is largely responsible for the shrinkage sustained in this branch of the paper industry.

Freight Rate Service on Wrapping Paper

To fill a real need in the industry the National Kraft Paper Manufacturers Association has arranged for a complete up-to-date freight rate service on wrapping paper, through Mr. James H. Noble, traffic expert of New York City. This service covers:

1—All rail rates from all kraft paper mills' shipping points to principal market points throughout the United States (compiled and available).

2—Similar rates via rail and water routes (now being compiled).

3—Rates by available transportation routes to additional competitive market points on request.

4—All changes in existing rates to the market points covered through supplemental sheets issued once a month, or oftener, as may be necessary.

The association's rate sheets are issued in mimeographed, looseleaf form, bound in a serviceable and attractive binder, to facilitate keeping the compilation up-to-date as subsequent rate sheets are issued.

The advantages of this service are manifold:

1—It provides an immediately available, up-to-date and accurate compilation of all existing freight rates covering transportation from kraft mills to market points. This will serve as a handy, convenient manual that will indicate what competition may be expected in the various markets, as well as the market in which the various mills can sell at a profit.

2—It supplies immediate accurate rate information that may eliminate the cause of many difficulties, loss of business or profits, if properly used.

3—It gives the same information to merchants and converters as is available to the kraft paper manufacturers, thus tending to improve distribution relations between kraft mills and their customers.

4—It provides a handy manual for operating, traffic and sales departments for use in computing costs, making sales and checking rates.

This service will undoubtedly have a strong appeal to merchants and converters. Inquiries for information should be addressed to O. M. Porter, manager, The National Kraft Paper Manufacturers Association, 122 East 42nd St., New York City.

The Southeastern Division of the American Pulp and Paper Mill Superintendents Association will hold its annual spring meeting in Chattanooga, Tenn., April 7 and 8. Those in charge of arrangements announce their expectations are for an unusually large attendance, and an interesting and valuable program of papers is promised. In addition to the business sessions, those attending will have the pleasure of sightseeing trips around the beautiful and historic city of Chattanooga.

F. E. Harrell has been appointed engineer in charge of drafting and experimental departments of the Reliance Electric & Engineering Company, Cleveland, Ohio, manufacturers of alternating-current and direct-current motors. Mr. Harrell has been with the Reliance Organization since 1924.

March, the National Safety Council points out, is the right month to begin planning a campaign to prevent the accidents which are coincidental with spring and summer.

American Paper & Pulp Ass'n Holds Greatest Convention in Its History

Management and Future Development of Association Greatly Strengthened by Amendments to Constitution Calculated to Make It a Real Power in the Industry

THE fifty-third annual meeting of the American Paper and Pulp Association was opened by President S. L. Willson in the banquet hall of the Hotel Pennsylvania on Thursday morning, February 20.

The first business taken up was the presentation of the President's annual address.

President Willson's Address

In the opening paragraphs of his address, Mr. Willson reviewed the action taken at the last annual meeting to bring about a reorganization, providing among other things for the appointment of a competent official to act as general manager. The incoming president and executive committee were authorized to take such action in the appointment of a manager as was deemed best. A man was sought for the post whose past experience and ability would qualify him best to assume the management and to create, develop, and apply remedies for the problems with which the association was confronted. Jesse H. Neal had been chosen for the position and notice of his appointment and installation had been sent out to the membership. He said that Mr. Neal was well equipped for working out the plans of the association and could be depended upon to do so, if he has proper support.

Independent Activities—Mr. Willson referred to the constituent group members and affiliated associations constituting the association and these would report upon the many and varied activities of the year. Referring to the group associations that have been formed to promote the interest of their members, he said that while believing they were necessary and would continue to function for good, some of them, he feared, had lost sight of the fact that other branches were equally important or perhaps more so than their particular group and that industry problems should be handled through the association that represents the entire industry. The absence of association support and co-operation was conspicuous. The association with proper support could be made more useful and more helpful to its members.

Unorganized Branches—Mr. Willson spoke of other branches of the industry that had not even formed group associations and said these should be formed for the same lawful end for which the others had been formed. There were also too many independent associations and committees that attempted to function for the entire industry. There was irritation on the part of some members who were asked to contribute first to the association and then to one or more separate activities. Mr. Willson said they did it liberally in many cases, yet some of these separate activities covered industry problems and should be financed by the association through the support of the entire membership, instead of being supported by a limited number. Too much duplication of effort was expensive.

Mr. Willson enumerated the various special associations and committees, as the Tariff Committee, the Cost Association, Special Legislation Committee, the Technical Association and the White Water Utilization Committee.

He discussed savings and concentration, the forestry problem, waste utilization and stream improvement, arbitration in the paper industry, labor problems, extension of export trade and the Institute of Paper Chemistry.

State of the Funds

The report of the treasurer was called for and Charles W. Boyce responded with a statement that the funds in the association for the fiscal year started last April amounted to $58,000. Added to this was a fund of $13,000 authorized to be withdrawn from the reserve, making available approximately $73,000 for the year's work. The total expenditures from April, 1929, to January, 1930, amounted to $54,209.07, while the total estimate of expenditure for the fiscal year was $70,000, leaving a reserve of $3,000. The report did not take into account additional expenses which were otherwise provided to carry the general manager's account from November to April.

On motion the report was accepted and placed on file.

President Willson then addressed the gathering, saying that he had made mention in his address of the new plan of reorganization and the selection and installation of a general manager. He said he was very much impressed with the way the new general manager had taken hold of affairs and now wanted to introduce him to the assemblage.

Address by General Manager Neal

Jesse H. Neal, the new general manager of the American Paper and Pulp Association, said he made his initial appearance before the annual business meeting with some trepidation, as he did not have the advantage of knowing the members as well as he hoped to know them later, and they did not know him as well as he expected to be known after longer acquaintance.

Discoveries in Biblical History—Mr. Neal said that when he came into the industry he had heard talk about it needing a Moses. He looked up Bible history to find out who Moses was, and what he really did, and discovered that while Moses did lead the children of Israel out of the land of bondage, he had been wandering around the wilderness for about forty years and never did reach the Promised Land. (Laughter.) Mr. Neal said he then discovered that the association was fifty-two years old and believing that the members had spent all the time necessary wandering around the wilderness, he proposed to start with them right into the Promised Land this year.

Services of the Association—In a study of the association's activities, the speaker said he had been greatly impressed with the free and voluntary service rendered through it to the industry by the highest type of men to be found in any industry. He said he had found much to admire in the foundation work of his predecessors Doctor Baker and Major Porter. To question the present standing of the association seemed to him like asking a man at his golden wedding, surrounded by eighteen children, whether or not marriage was a failure. No institution could grow and endure as the American Paper and Pulp Association had for fifty-two years without vitality of inherent virtues and demonstrated value.

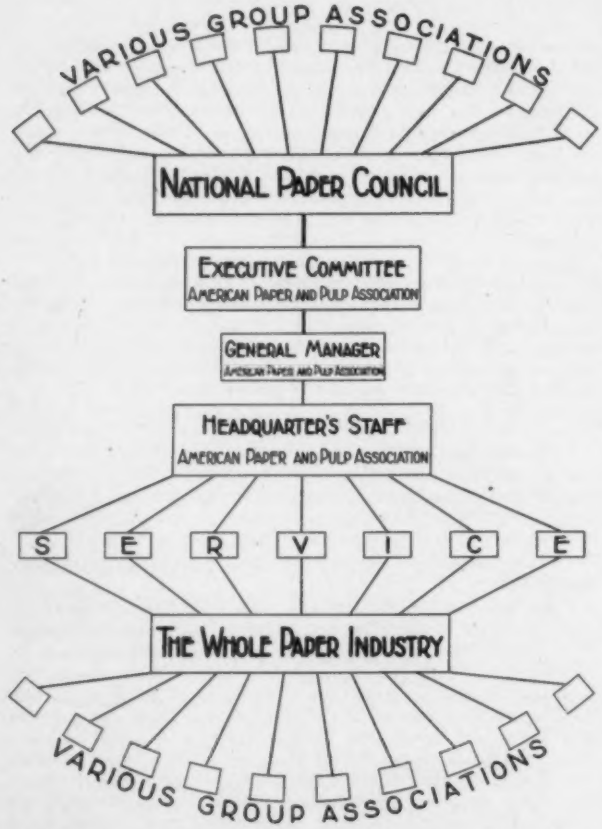
In a somewhat lengthy address, relieved by flashes of wit and an occasional humorous story, Mr. Neal undertook to present a picture of the association's work, and succeeded admirably.

Activities of the Association—Speaking of the association's statistical work and its general functions, Mr. Neal said that the system was characteristically American. In foreign countries regulation of trade and industry was done through compulsory agreements and arbitrary fiats imposed upon industry. It was different in the United States where we worked toward uniform action, independently determined from a common set of known conditions. The main essential, he

said, was to know the facts, to have all units in any field recognize and accept these facts.

Quotes President Hoover—General Manager Neal quoted President Hoover on the functions of trade associations. In his last message to Congress President Hoover said these functions were, "To determine facts, to develop the relative importance to be assigned to them, to formulate a common judgment upon them, and to realize solutions in a spirit of conciliation."

Praise for Woodland's Section—After a reference to the work of distributing statistics for group associations, he spoke



Graphic representation of A. P. & P. A. reorganization

of the work of the Woodlands' Section, which was devoting itself wholly to the economic aspects of forestry. In the publication of the section, known as "Pulpwood," information was given concerning forestry conditions in the conservation of pulpwood, not to be found elsewhere.

He touched on other activities of the association such as the work of the committee on the new tariff, and expressed regret that the hat had to be passed to raise money to finance it. This should not be necessary if the American Paper and Pulp Association were properly financed. The income of the association should be sufficient to provide for contingencies or emergencies of this kind. It was noteworthy, he said, that the amount contributed for tariff work exceeded by many thousands of dollars the entire budget of the American Paper and Pulp Association for every other purpose and the money came from a comparatively few public-spirited manufacturers.

Will Extend Export Trade—In a reference to the development of export trade, he reminded his audience that export sales fill in the depression in domestic demand, enable continuous and uninterrupted high volume with consequent low production costs, and at the same time create wider margins of profit on domestic sales. The interest of the majority of mills in export trade had been casual or sporadic, and needed strengthening.

Mr. Neal said he proposed, with the consent of the Executive Committee, to make a survey of paper consumption and the possible openings for American paper in every country to which paper can be shipped. He intended also to publish advertisements in export publications over the name of the American Paper and Pulp Association to discover points of interest capable of further cultivation all over the world.

A Cost Section—Contingent upon satisfactory arrangements between the governing committees of the Cost Association and the American Paper and Pulp Association, it is proposed to make the first named association a department of the general association, financing it from a general budget and so doing away with separate dues. Mr. Neal said he thought the time had arrived for this because of the greater appreciation of mills of the value of cost work. It is also proposed to expand the bulletin service of the association and to start a new bulletin to serve as a medium for what might be termed strictly family need.

Mr. Neal touched on a number of problems which called for immediate attention during the coming year and among these was control of overproduction. He named five divisions or groups of remedies for overproduction.

National Paper Council to be Formed—Mr. Neal then described a simple plan of organization, or reorganization of the association and its activities, which he illustrated by means of a diagram on a blackboard drawn with white and colored crayons, as indicated herewith.

He said it was proposed to organize a National Paper Council composed of one national paper councillor from each group association which would select its representative in its own way once a year. The National Paper Council would create a governing board for the American Paper and Pulp Association, as one of its functions would be to act as the resolutions committee of the association, to dictate, mould or suggest basic matters of policy. The National Paper Council would be the medium of contact with all group associations and would create the Executive Committee which in turn supervises the staff of the American Paper and Pulp Association. He said that an amendment to the Constitution would be presented later to cover the changes proposed.

President Willson said the proposed changes in the Constitution would now be presented.

Mr. Neal said that many of the changes were merely verbal changes as a matter of form, such as inserting the term "general manager" where the word secretary appears, and providing that the general manager may also be the treasurer or secretary. (At a subsequent meeting of the Executive Committee, Mr. Neal was named treasurer of the association.) Other changes include making the president an ex-officio member of all committees. The general manager is to be chief administrative officer of the association in general charge of headquarters, the operating staff and all activities of the organization, and an ex-officio member of all committees. The secretary is to be an assistant to the general manager and perform any other duties that may be assigned to him.

Organization of National Paper Council

The organization of the National Paper Council was described in a proposed amendment to the Constitution. The Council is to be organized by the Executive Committee of representatives from each affiliated organization of paper or pulp manufacturers or converters, providing they are company members of the American Paper and Pulp Association. The term of office of each councillor is one year, expiring with the annual meeting of the American Paper and Pulp Association.

Size of Firm to Define Voting Powers—Another amendment defined the voting powers. Each individual company member is to be entitled to one vote on gross sales less than $1,000,000; two votes on sales up to $3,999,000; three votes on sales up to $6,999,000; four votes on sales up to $9,999,000 and five votes on sales of $10,000,000 or over.

The proposed amendments were offered for adoption and a motion to adopt was offered by D. Clark Everest.

Discussion on the Amendments—Some spirited discussion ensued. C. A. Crocker inquired as to the basis of payment of dues and was told that it was part of the plan to make repre-

sentation according to size, and contributions or dues on the same basis.

George W. Sisson, Jr., objected to the plan, saying he could not agree to proportional representation, deeming it un-American.

Representation of Unaffiliated Groups—O. M. Porter inquired if membership on the National Paper Council was open to unaffiliated groups like the newsprint manufacturers, the kraft wrapping paper manufacturers, etc.

Mr. Neal said that all the points made by Mr. Porter had been carefully considered. Being an international organization the News Print Service Bureau could not participate in strictly national matters. So far as unorganized groups were concerned one of the inducements for organizing would be representation on the National Paper Council. The groups that were not now affiliated would be asked to come in, and under the new plan he thought they would not hesitate about affiliating, specially if the Executive Committee would remove the fee.

Move to Eliminate Proportional Voting—After a considerable discussion, a motion was made by Mr. Sisson that the changes in the Constitution be approved except that one which had to do with proportional voting based upon the business done by the company member.

Mr. Everest accepted the amendment and more discussion ensued until the question of membership on the National Paper Council was throughly cleared up.

Colonel B. A. Franklin insisted that the National Paper Council to be properly representative of the entire industry should have all the different grades of paper represented on it, the book grades, wrapping, etc., for how could the Council advise if the largest tonnage was not represented on it.

Mr. Brown thought that if the wording were changed so that group divisions might be included it would clear up matters.

Mr. Neal thought it was safe to say that in the course of a year there would not be any unorganized group of any consequence in the industry.

A vote was then taken on the adoption of the proposed amendments to the constitution, with the exception of the one referring to voting powers, and it was put to a vote and carried.

Mr. Crocker Wants Amendment Voted on—C. A. Crocker thereupon moved the adoption of an amendment relative to the voting power as originally in the amendment. Mr. Sisson asked if the Constitution had not already been adopted with the omission of the clause referred to.

Mr. Crocker insisted he was offering it for consideration, as it had been omitted, which brought the retort from Mr. Sisson that it had not been omitted but was voted down.

Appeal to the Chair—An appeal to the chair was made for a ruling. President Willson ruled that there had been no direct action on the particular amendment and if it was offered as a new amendment he would entertain it.

Mr. Crocker Pleads for Motion—Mr. Crocker asked to be heard on the motion and made a most impressive speech. He said he had been a member of the association for nearly fifty years and this came near to being his swan song. He said it seemed deplorable to him for an industry so large as the paper industry to have had such a kindergarten sort of organization all this time. The amount of money that was contributed to its support was ridiculous, some of the subassociations having budgets larger than the main association. He believed that Manager Neal had stated the case very fairly. The question of stock vote would not arise except in matters of very great importance where a large amount of money was involved, "and if it is our money we ought to be able to vote in proportion to the amount we contribute," he said.

Mr. Crocker's Motion Adopted—Mr. Sisson still opposed the adoption of the amendment, but there were calls for the question and the motion was put to a vote with the result that it was adopted. Mr. Sisson still protested and called for a show of hands, when only five hands were raised in opposition, twelve voting for the amendment. The amendment was then declared adopted.

AFTERNOON SITTING

Reading of Committee Reports

At the afternoon sitting, with President Willson in the chair, reports of committees were presented, one of the standardization committee and one of the tariff committee. Mimeograph copies of the standardization committee report had been distributed and Mr. Marcuse in reporting for the tariff committee, regretted that the final report could not be brought in at that time. He said that one of the hardest tasks the tariff committee had was in financing its work. He was happy to think that in the reorganization of the association it would not be necessary to ask the same people to put up twice for the same thing.

Bearing a Foreword by Jesse H. Neal, general manager, and an Epilogue by Charles W. Boyce, secretary, a series of staff reports and committee reports for the year 1929 were available to members in printed form, and this expedited the transactions of the general business meeting. In his foreword, Mr. Neal said:

"Having been with the organization but a few days over three months, the writer believes it fitting that the report of our activities during the past year, should be made by those who assumed the responsibilities and achieved the results.

"A just appraisal of the year's progress, will disclose more than a proportionate return to the industry for the amount invested. Every one of the department heads and each employee displayed a loyal, intelligent interest in the work and gave unsparingly of their best efforts, oftentimes in disregard of personal convenience or the regular working hours.

"The pleasure of working with such a staff is second only to the pride which should inspire any man given the opportunity of playing some part in promoting the welfare of an industry such as ours."

Overproduction and Its Consequences

In an introduction to the series of reports, it was set forth that American paper consumption in 1929 had increased more than half a million tons; production increased nearly as much, but the proportion of idle machine capacity in the industry remained at a quarter of the total. There was hence a temptation to overproduce, and many producers did, with the inevitable result. When supply exceeds demand, healthy competition is replaced by a destructive variety in which price slashing, order buying and wholesale disregard of market requirements spread as a ripple on a lake throughout the whole industry.

Advantages of a Central Organization—New alinements in business, remarkable technical progress and substitution of product, it was noted, had been particularly marked in the paper industry since the war. Many aspects of the industry are undergoing radical change. . . . Because of the many grounds in the industry, principally common sources of raw material, common methods and technic of manufacturing, possibilities of wide substitution of pulps in manufacture and of products in meeting consumption requirements, the American Paper and Pulp Association has other important functions that can be handled adequately only through a central organization. The purpose of the report was to describe the activities of the association—staff activities conducted by executives continuously employed by the association, and committee activities, largely related to policies.

Executive Changes—Here followed an account of staff activities, beginning with the work of Major O. M. Porter, who succeeded Dr. Hugh P. Baker as executive secretary. Mr. Porter left the association in July, 1929, and was succeeded by Charles W. Boyce, formerly assistant secretary, as acting secretary. At a meeting in September, 1929, the Executive Committee appointed Jesse H. Neal, general manager of the association, and Mr. Neal assumed office on November 1, 1929.

Staff Activities—Following this came a statement of the activities of the association under the headings of "Service to Members," "Weekly Business Review," "Statistical and Special Reports" (including the monthly bulletin "Pulpwood"), "Direct Service," "Statistics" (with special praise for J. A. C. Kavanagh's "tireless drive to secure a complete statistical picture of the industry"), "Waste Utilization" (under the direction of C. M. Baker, the association's engineer), "Woodlands Section Service" (attention was called to

the notable series of studies of present and future pulpwood prices in the major papermaking regions, which are of so much significance to paper manufacturers), "Supply and Equipment Section," "Foreign Contacts."

Committee Reports—The foregoing staff reports were followed by committee reports signed by their respective chairmen, as follows: Committee on Tariff, Milton E. Marcuse; Committee on Statistics, C. B. Morgan; Joint Committee on Approved Pulp Testing Chemists (in this report mention was made of a study by a special committee consisting of R. C. Griffin, Allen Abrams, H. V. Knudsen, E. S. Hinman and W. A. Chapman, of the official rules with a view to their improvement. The rules as revised were approved by the joint committee on January 9, 1930, and will be available at a nominal price to those interested. The chairman of this committee is S. Goldman; Joint Committee on Vocational Education of the Pulp and Paper Industry, J. Norman Spawn; Advisory Committee to the Forest Products Laboratory, R. H. Laftman; Advisory Committee to the Bureau of Standards, Bjarne Johnsen; Advisory Committee to the Lake States Forest Experiment Station, D. C. Everest.

In the epilogue or conclusion by Charles W. Boyce, generous acknowledgment was made of the support he had received from members of the association's staff, singling out for special mention J. A. C. Kavanagh, statistician, and Mrs. Oliver J. Rogers, office manager.

Resolutions Adopted

The report of the resolution committee was then presented for adoption by Paul F. Fisk. The various resolutions began with an expression of regret over the loss sustained by the association through the death of seventeen members, and followed with others relating to research and technical control and the support of affiliated associations; the development of statistical work, encouragement of foreign trade, waste elimination and stream improvement. A resolution relating to dues set forth that in 1927 and 1929 resolutions had been adopted basing dues upon the total gross sales of individual company members and the time had now arrived to put the plan into active operation. Arbitration was adopted in the settlement of disputes and the president was appointed to appoint a committee to invite other associations and the American Arbitration Association to meet and consider suitable arbitration clauses for inclusion in contracts.

Co-operation in furnishing statistics was urged in another resolution and a study of costs to provide figures for depreciation and obsolescence recommended.

Support was given to the resolution adopted at the Woodlands Section meeting in relation to forestry practice for pulpwood production.

The Institute of Paper Chemistry

President Willson called attention to the reference in his address to the Institute of Paper Chemistry. He said that Ernst Mahler, president of the institute, had kindly consented to speak of the developments and future possibilities of the institute.

Mr. Mahler, who was received with cheers, said that the Institute of Paper Chemistry had been organized a few months ago in affiliation with Lawrence College at Appleton by 90 per cent of the paper and pulp manufacturers of the State of Wisconsin.

Reasons for Affiliating with Lawrence College—He said that the readiness of the college which was an institution eighty-two years old, to co-operate with the industry, was justified by its high scholastic standing. He desired to say, in view of some questions that had been raised, that there were several reasons why the Institute should be affiliated with the college. One reason was that any subscriptions to the institute would be deductible from the Federal Income Tax because of its affiliation. Further, by being affiliated with a recognized educational institution, the institute acquired the right to confer degrees. While degrees alone did not mean very much, it was important to the man who spends his time and energy in an educational institution and passes examinations that he be awarded the proper degree.

Mr. Mahler said that the Institute was owned by the manufacturers who had subscribed the funds. The president of Lawrence College was one member out of seven on the board.

Funds Subscribed—Wisconsin paper manufacturers had subscribed a fund of $300,000 for the support of the institute and this sum had been augmented by subscriptions of individuals and corporations by $30,000 for the establishment of a library and fellowships for worthy students.

Need of the Institution—Speaking of the necessity for such an institution as the Institute of Paper Chemistry, Mr. Mahler said that while several universities and colleges had been giving special courses during the last ten years appicable to chemistry and engineering in the paper industry, so far as he knew none had ever turned out a graduate sufficiently trained so that he could take a position and be trusted with the technical problems that arise every day in the course of business.

England had long recognized the necessity of such institutions of higher learning and they existed in every industrial country in Europe.

Institute Is Functioning—The Institute of Paper Chemistry started to function on February 3, with a well equipped laboratory, a teaching staff and the beginnings of a library. Mr. Mahler urged all present to centralize their efforts on education and research at the Institute of Paper Chemistry. More talent and a student body conscious of its work would get results quicker and for considerably less money than if fellowships and separate laboratories were established.

President Willson thanked Mr. Mahler and said the Wisconsin manufacturers were to be commended for their courage in starting the institution.

Clark D. Everest was then introduced to make an address on regional shifts in paper production.

Regional Shifts in Production in the Paper Industry

Mr. Everest made a remarkably interesting contribution. He went back to the beginning of papermaking in China and papyrus in Egypt. Today China makes but little paper and Egypt, which once supplied the civilized world with papyrus, does not manufacture a pound of paper.

Papermaking was introduced into Europe by the Saracens who established the first paper mill in Spain, flax being the first material used and later cotton. Rags were first used in Spain in 1085 and the first linen paper was made in 1100. The development of the industry was slow, but it kept pace with the educational development. Italy had mills soon after Spain. France began manufacturing in 1189, England began in 1330 and Germany in 1390.

He spoke of the continual shifting development in America from 1690 when William Rittinghuysen and William Bradford opened the first paper mill on American soil on a creek since known as Paper Mill Run near Philadelphia. The paper was made from homegrown flax.

Fifteen years later some forty mills were in operation in Pennsylvania, Delaware and New Jersey, with an annual production valued at more than half a million dollars.

Mr. Everest traversed the history of the development of papermaking and its regional shifts in all parts of the country and Canada down to the present day. He presented a paper which is not well adapted for abstracting and we reserve publication of it in its entirety to a later issue.

President Willson then asked George H. Mead to take the platform for an address on sales policies.

Address by Geo. H. Mead

Mr. Mead began by reading the contents of a telegram which had been received by him, but presumably from the secretary of the association, inviting him to speak on "Profitable Sales Policies Under Present Conditions of Overproduction."

Mr. Mead said he thought any gentleman in the room receiving such a telegram would be breathless in getting to a telegraph office to decline the invitation. That was his own idea and he immediately wired a declination, but his conscience troubled him after thinking of the tremendous amount of energy and effort President Willson had expended in association work during the past year, so he relented and sent another telegram saying he would come.

Worked Hard on Profitable Sales Policies—His chief effort was occupied with expounding a profitable sales policy under

the present overproduced condition, but he worked very hard. He asked his hearers to judge of his relief and joy when he saw on the program of the meeting the subject of his talk described as "Sales Policies," without reference to profits or overproduced conditions. He therefore destroyed what he had put together and decided to deal only with sales policies which so far as he has been able to observe in the past twenty-five years had little to do with the word "profitable."

At the start he deplored the lack of proper leadership in our industry. Leadership came not from an individual but from the well established and well co-ordinated business of the industry.

A Believer in Mergers and Consolidations—Mr. Mead is a believer in mergers and consolidations of manufacturing units in certain lines, combinations of manufacturers had proven of tremendous value to their industry. He instanced the United States Steel Company as the leader in the steel business and spoke of leaders in other industries such as the harvester industry (farm equipment), electrical industries and recent combinations in the motor industry. Early ventures on the part of the paper industry were not equally successful. He instanced the newsprint combination, and the combination of writing mills as having gone through a period of difficulties, and the failure of these units had prevented or militated against the formation of further combinations in other branches of the industry.

Association Work Necessary—The speaker said that the history of industrial development proved conclusively that no industry could prosper without intensive association work, and he felt that the executives of the paper industry had neglected both of these factors. The associations were not so seriously conceived as they should be. The last thing that should be considered in association work was the price of the article dealt in. He said he had learned that from the Department of Justice in Washington. (Laughter.)

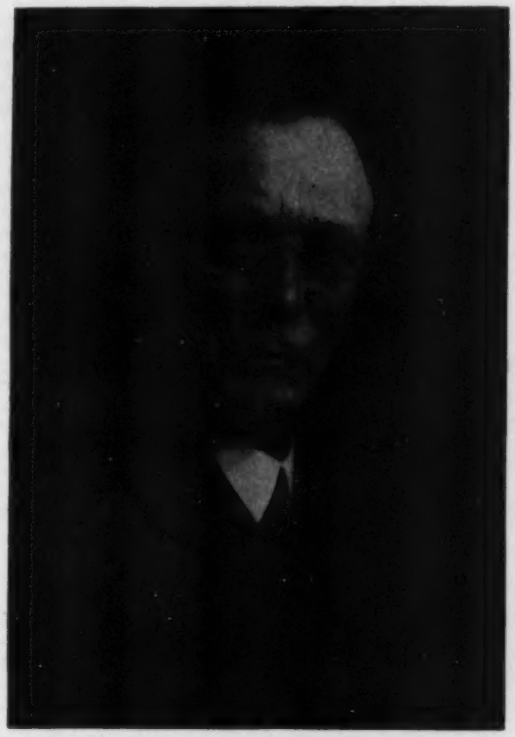
Spirit of the Times—He was of opinion that if association work was carried on with the right thought and incentive behind it, the question of price would take care of itself. Association work was the spirit of the times and he pointed to the naval parley in London and the efforts of the Farm Board in Washington as examples.

Consolidations Profitable—Consolidation in connection with association work must come next. There has been great opposition to the consolidation of units of the paper industry into larger and stronger groups as a consequence of the failures instanced by him at the beginning of his address, but that present-day consolidations would prove profitable, he said there could be no doubt.

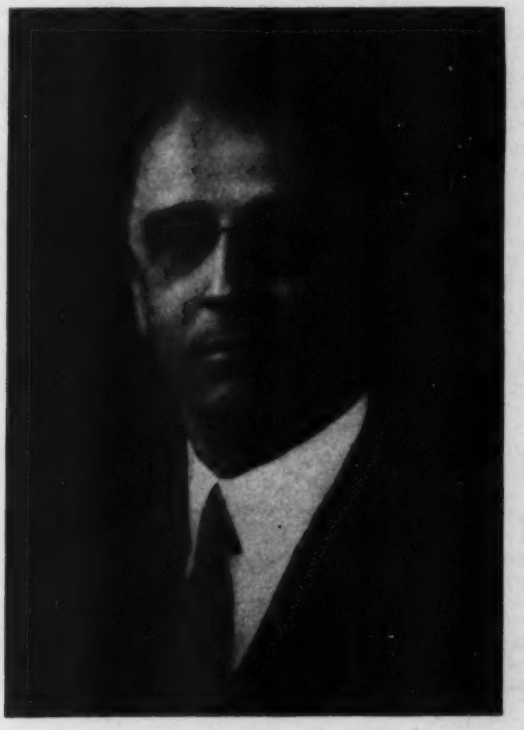
Sees a Great Era of Prosperity Ahead—Mr. Mead said we could visualize at the present moment an era of prosperity over the next ten years that would far exceed the past ten years of postwar business. Competition would arise, he said, such as had not been seen in the past and he thought it would be more difficult in the immediate future to advance the prices of articles more than they have been advanced in the past ten years.

He called attention to the prosperity of the United States. With but 7 per cent of the population of the world, we own at the present time at least 75 per cent of the motor cars of the world. He said that the total estimated number of cars in existence at the present time was 30,000,000, and of this number 23,000,000 are owned and operated by residents of the United States. Of the remaining 7,000,000 many have been produced in the United States and shipped abroad. The wealth of the United States, he said, was almost fabulous. We have at the present time at least 50 per cent of the monetary gold in the entire world, with only 6 per cent of the territory of the world.

Other figures were cited by him to show the economic position of the United States. He paid a tribute to the efforts of President Hoover and the Government to co-operate with business and with the industry of the United States. The calling of the advisory council had in his opinion shortened any period of depression and overproduction that we might have had by at least 50 per cent. He was convinced that the country was on the threshold of a great period of prosperity.



Sidney L. Willson
President, American Paper & Pulp Association



Jesse H. Neal
General Manager, American Paper & Pulp Association

President Willson made his acknowledgments and the acknowledgments of the association to Mr. Mead for his splendid address. He considered it a personal compliment that Mr. Mead had come from the southern recreation ground to address the meeting. He agreed with Mr. Mead in his message of optimism as expressive of the tendency of the time. There would be many changes in the paper industry in the next two years and the association ought to be built up to meet them.

Another of the interesting addresses made at the afternoon sitting was on a working alliance between labor and capital by Adam Wilkinson, of the American Writing Paper Company.

Officers Elected

In the election for officers, Winthrop M. Crane, Jr., was nominated and elected to take the place of Flex Pagenstecher, retired. The list of officers for 1930-1931 stands as follows:

President—S. L. Willson, American Writing Paper Company, Holyoke, Mass.; vice presidents—Milton E. Marcuse, Bedford Pulp & Paper Company, Richmond, Va., and Winthrop Murray Crane, Jr., Crane & Co., Inc., Dalton, Mass.

General Manager—Jesse H .Neal, 18 East Forty-first street, New York.

Secretary—Charles W. Boyce, 18 East Forty-first street, New York.

Executive Committee—S. L. Willson, Hugh J. Chisholm, Winthrop M. Crane, Jr., D. C. Everest, George W. Gair, A. R. Graustein, M. E. Marcuse, C. B. Morgan, Norman W. Wilson.

It was announced by the Executive Committee that Jesse H. Neal, general manager, had also been appointed treasurer of the association.

Annual Dinner of A.P.P.A. at Pennsylvania Hotel

Fifty-Third Annual Affair Is One of Great Brilliancy—Notable Speeches and Entertainment

THE Grand Ballroom of the Pennsylvania Hotel where this year's banquet of the American Paper and Pulp Association was held appeared to lack the spaciousness of the hall in the Waldorf-Astoria in which the banquets had been staged for so many years previously, but this was not actually the case, the effect of more limited room being caused by the shape of the hall and arrangement of the head table which extended in lengthwise fashion along the wall facing the entrance, and not on a stage as in the old Waldorf-Astoria.

Hall Appropriately Decorated

The decorations of the banquet hall were peculiarly appropriate to a gathering of paper manufacturers and paper merchants, consisting of festoons of paper in long, narrow strips, tinted green, tan and light yellow. Instead of the conventional vases of flowers, each table held a large bouquet made of paper in bright tints to resemble spring flowers and foliage. Paper flowers to imitate jonquils and other spring flowers decorated the speakers' table and the walls behind were festooned with American flags, the flags being flanked with large medallions of the Indian head emblem of the association, ingeniously modeled by hand from pulped tissue. On either side of the Indian head medallions, hung large standards formed of a rich yellow tissue framed with gilt paper, having dependent fringes of fluffy green tissue, and bearing in large gilt paper cut-outs, the letters "A.P.P.A." The decorations were furnished by Dennison Manufacturing Company, Framingham, Mass., of a specially fireproofed material and were greatly admired.

Attractive Menu

The menu consisted of a twelve-page booklet, with covers, printed on the Keith Paper Company's Autumn Response, a parchmenty sheet excellently adapted for the purpose. In addition to a tempting menu of six courses, the leaves contained lists of names of the speakers, banquet committee, officers, evecutive committee and past presidents of the association, making a most artistic souvenir of the dinner, which was the fifty-third in the history of the association, as held on Thursday evening, February 20.

Before entering the hall the guests were provided with a sixteen-page booklet containing a diagram of the seating arrangement and the names of all present, including the guests of honor at the head table, who comprised A. B. Daniels, George W. Sisson, Jr., A. C. Hastings, George W. Gair, Charles Milton Newcomb, Harold Crabtree, Col. Wm. J. Donovan, S. L. Willson, toastmaster; Dr. Nehemiah Boynton, Jesse H. Neal, D. C. Everest, K. S. Warner, Felix Pagenstecher, M. E. Marcuse, Walter J. Raybold and Judge Charles F. Moore.

President of Canadian Association Cheered

Jollity and good cheer prevailed throughout the dinner and President Willson had some difficulty in calling the gathering to order after the coffee was served and cigars lit. Before making his own set speech, Mr. Willson called attention to the presence at the speakers' table of Harold Crabtree, president of the Canadian Pulp and Paper Association, and suggested that he might like to say a few words to his friends below the line.

Promises Co-operation

Mr. Crabtree was received with many friendly demonstrations and when the cheering had subsided he made a brief and pleasing address. He said he was glad as president of the Canadian Pulp and Paper Association to express to those present the best wishes of the Canadian manufacturers, and continued:

"If there is anything that the Canadian Pulp and Paper Association can do to work out the common problems affecting the American Paper and Pulp Association, you may depend upon it that we shall do what we can to effect a happy solution. As President Willson said in addressing our association in Montreal, we presidents must stand together and so should the associations."

Before taking his seat President Crabtree made gracious acknowledgments of the many courtesies he had received from the officers of the American Paper and Pulp Association since his arrival in New York.

President of Merchants' Association Greeted

K. S. Warner, newly elected president of the National Paper Trade Association, was introduced and expressed the pleasure it gave him to represent the paper merchants of the United States at the annual banquet of the paper manufacturers.

Jesse H. Neal Introduced

After a reference to the formation of a new office in the association, that of general manager, Mr. Willson introduced Jesse H. Neal, the incumbent of that office, who expressed his appreciation of the courtesy.

Ovation for Judge Moore

President Willson then arose and turning to a figure seated in an invalid chair at the far end of the table, said it would be a pleasure to hear from their old friend Judge Moore, whereupon the assembled diners stood up en masse and cheered vociferously.

Speech and Poem from Judge Moore

Judge Charles F. Moore spoke in a loud clear voice, though visibly in a weakened condition from the illness which has afflicted him for the past eight years. He said he was very happy at the cordiality of the reception which had been accorded him and was sure that the association would make splendid progress under the management of his friend Jesse H. Neal, whom he knew as an active worker who would be hard to keep up with.

Judge Moore said he began to form the habit of attending the dinner gatherings of the American Paper and Pulp Association at the annual meeting held thirty-five years ago when his friend Col. A. G. Paine was the presiding officer and Henry A. Wise, T. B. Reed and himself were speakers. He had continued with the association until eight years ago; had made one "last appearance" four years ago, and was now here again to make another "last appearance."

Judge Moore said that the last eight years, though not painless ones, had been years of uninterrupted happiness and serenity for him. There was a hush in the audience as he said with much feeling, "I have no misgiving as I approach the land of mystery and silence. You have placed my hand on the plough and my feet in the furrow and I will keep on going." He closed an affecting talk by giving from memory the following lines from Kipling:

"When Earth's last picture is painted and the tubes are twisted and dried,
When the oldest colours have faded, and the youngest critic has died,
We shall rest, and, faith, we shall need it—lie down for an aeon or two,
Till the Master of All Good Workmen shall put us to work anew.

"And those that were good shall be happy: they shall sit in a golden chair;
They shall splash at a ten-league canvas with brushes of comet's hair,
They shall find real saints to draw from—Magdalene, Peter, and Paul,
They shall work for an age at a sitting and never be tired at all!

"And only the Master shall praise us, and only the Master shall blame;
And no one shall work for money, and no one shall work for fame,
But each for the joy of the working, and each, in his separate star,
Shall draw the Thing as he sees It for the God of Things as They are!"

President Willson's Address

The set program of the evening was then taken up and President Willson addressed the gathering in a speech, the keynote of which was good fellowship and co-operation among members of an industry "as vital to business as food is to mankind." He said that lack of understanding was the basis of all our troubles and that association activities, with the necessary personal contacts and interchange of ideas, made for mutual understanding and the establishment of friendship and confidence.

Indispensable Character of Papermaking—After some witty applications of the Adam and Eve legend to the development of association work, and a reference to information he had acquired concerning the constitution of the human body from a paper trade magazine, he went on to speak of the indispensable character of our industry and the necessity of a well-supported association. The members of an association should contribute freely, willingly, and generously to its development. Results come only from co-operative efforts, but co-operative effort was often unproductive because some necessary factor of co-operation was lacking.

Colonel Donovan's Speech

President Willson introduced Col. William J. Donovan, as the next speaker, saying that he was one of two men to receive all three Congressional medals for bravery in battle, was a former Assistant Attornel General of the United States and now Colonel of the 165th Regiment, the old 69th of New York City.

Functions of Federal Trade Commission—The chief feature of Colonel Donovan's speech was an argument for a rearrangement of the functions of the Federal Trade Commission to remove duplication of jurisdiction. Certain hardships encountered by business which are attributed to the Sherman

Picture taken at the fifty-third annual banquet of the American Paper and Pulp Association, February 20, 1930, at the Pennsylvania Hotel, New York City

and Clayton acts, he said, would more properly be attributed to the fact that these acts are enforced in the courts by the Attorney General while the Federal Trade Commission, designed as a co-operative regulatory body for the business world, carried on its functions entirely unrelated to the anti-trust activities of the Attorney General. He recommended that all anti-trust work carried on by the Attorney General, except criminal actions, be taken before the commission rather than the Federal courts.

Anti-trust laws, he said, were based on the theory that public welfare requires the maintenance of free competition. The Federal Trade Commission, however, has come to recognize that too much competition may be as injurious to the public as too little. The two ideas should be brought together, he said.

Commission Should Be an Advisory Body—"The Federal Trade Commission should be changed from a body having the combined powers and duties of an investigator, prosecutor and judge into a body advisory and quasi-judicial," he said. "The Attorney General alone should have the authority to institute proceedings to prevent and restrain violations of the Sherman law. Except in criminal cases, which should be presented to the District Courts, all proceedings instituted by the Attorney General should be brought before the Federal Trade Commission. Unfair competition cases could be instituted before it not only by the Attorney General but by private litigants. From its decisions review could be made, as now, either by the Circuit Court of Appeals or perhaps by a specially constituted court, the determination on review being final except as to constitutional questions.

Changes Advocated—"Parties entering into agreements affecting interstate commerce should be given the right to submit their proposed plan to this commission, and in such cases the commission should be authorized and directed to give advisory opinions when, after a hearing at which the Attorney General should appear on behalf of the Government, the commission finds that the giving of such opinions would be in the public interest. It should be further provided that any finding made by the commission relative to such advisory opinions constitutes prima facie evidence in any subsequent civil proceeding involving the same facts, and preventive of criminal prosecution.

Object of Anti-trust Laws—"We are really confronted with challenge to our skill in the business of government in adequately meeting this problem short of broader governmental control and participation. The real object of government under these anti-trust laws is to equalize conditions and to insure that industry shall play the game according to the accepted rules of social justice. That is the test of our ability in government."

As Colonel Donovan took his seat, a blare of trumpets was heard at one end of the room, and a quartette of women trumpeters, preceded by a page boy holding aloft a silver salver piled with messages addressed to the President of the American Paper and Pulp Association marched into the hall. After circling the hall, playing on trumpets and trombones, they followed the page boy to the center of the speakers' table where messages of a congratulatory character from many foreign paper trade associations, the Chamber of Commerce of the United States and Secretary of Commerce Lamont were delivered to Mr. Willson, who opened and read each one aloud. There were communications from the Finnish Paper Mills Association, the Paper Makers' Association of Great Britain and Ireland, the Society of German Paper Manufacturers, the Norwegian Paper Makers' Association, Swedish Paper Makers' Association, German Association for Cellulose and Paper Chemists and Engineers, French Syndicate of Manufacturers of Paper and Cardboard, and others. Following this there was another fanfare of trumpets heralding some really fine musical selections which were received with evident appreciation by a delighted audience.

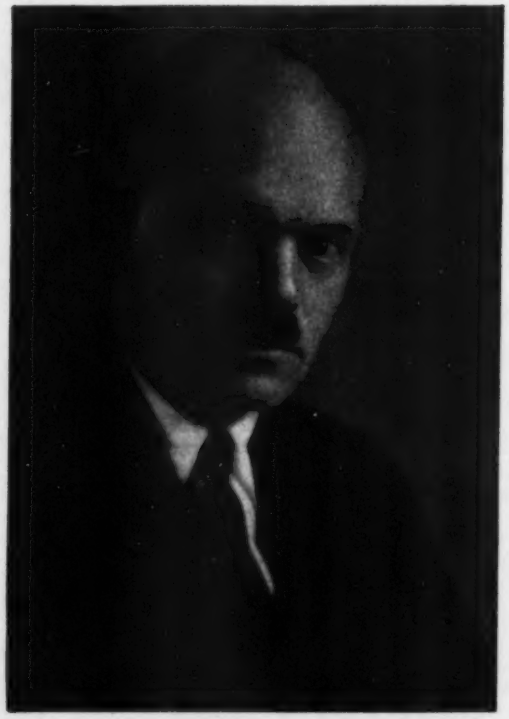
"Iron in the Blood"

The speechmaking was brought to a close with a stirring homily from the Rev. Dr. Nehemiah Boynton on meeting the necessities of life and making sacrifices for the common good. The burden of his speech was the facing of responsibilities with courage and resolution, the need of the day being "Iron in the Blood."

Then followed an intensely humorous dissertation by Charles M. Newcomb on "The Psychology of Laughter," which contributed immeasurably to the gayety of the evening.

Charles W. Boyce Elected Secretary of A.P.P.A.

Charles W. Boyce, formerly of Rochester, N. Y., was elected secretary of the American Paper and Pulp Association at the annual meeting on February 20, to assist General Manager Jesse H. Neal in the management of the association's activities, and was also elected secretary-treasurer of the Woodland Section of the association, the section composed of the



technical foresters in the employ of the paper mills. Mr. Boyce, after graduating from the Forest School of the University of Michigan at Ann Arbor, Mich., was in the United States Forest Service until about a year ago when he was put in charge of the Woodlands Section work, and later made acting secretary of the association. When with the United States Forest Service Mr. Boyce was stationed at Washington in charge of economic forestry investigations in the paper industry.

Chemical Engineers Appoint LeMaistre Executive Secretary

Frederic J. LeMaistre, consulting chemical engineer of Philadelphia, has been appointed executive secretary of the American Institute of Chemical Engineers. The official headquarters of the organization, which incidentally was founded in Philadelphia in 1908, are shortly to be transferred to the Bellevue-Court Building in that city.

Mr. LeMaistre, a Canadian by birth, has been identified with American chemical industry ever since his graduation from McGill University in 1904. After two years with the American Cement Company, he joined the du Pont Company and remained with them for 14 years. During this period he received an unusually broad chemical engineering experience in the manufacture of explosives, solvents, pyroxylin and artificial silk.

Proceedings of the Annual T.A.P.P.I. Meeting in New York

Program of Papers, Reports and Discussions During a Three-Day Session Points to Development of Aims and Value of the Organization

THE series of meetings held by the Technical Association of the Pulp and Paper Industry during the four days from Monday to Thursday, February 17-20, at the Hotel Pennsylvania, New York, were well attended and proved of considerable interest and value. There were no stated meetings of committees on Monday, but the executive committee came together at the Chemists' Club, 52 East 41st Street, for the discussion of association affairs and a luncheon. A general session of the association was convened in the Grand Ball Room of the Pennsylvania hotel under the chairmanship of President P. H. Glatfelter on Tuesday morning, the only other general session taking place immediately after luncheon in the Southeast Ball Room on Thursday afternoon when officers were chosen to serve during the ensuing year and certain amendments to the Constitution and By-laws were proposed. At the opening session on Tuesday, the chairmen of standing committees were heard from with reports of accomplishments and future plans. Upwards of 150 members attended the general sessions on Tuesday and Thursday.

President's Address

The annual meeting was called to order by President Glatfelter in the Grand Ball Room at 10 o'clock on Tuesday morning, the first business taken up being the reading of the President's address. In this, Mr. Glatfelter reported that substantial progress had been made by the association in 1929, not only by increasing the membership, but by adding to the surplus in the treasury. New members had been recruited in foreign countries where valuable contacts had been established. The roster of membership now included not only executives, managers, superintendents, engineers, and chemists in the industry, but also technical men from allied industries and others interested in the application of technology to the manufacture of pulp and paper.

Importance of Committee Work—President Glatfelter pointed out that the life of the association depended upon the personnel of its standing committees, no other function being of so much importance as committee activity. His charge to members was that as the years multiply and the work grows more strenuous, enthusiasm of committees should not relax, but continue to be the chief factor in building up a strong organization.

Local Sections—Referring to the organization of territorial groups, he said that these would serve as valuable feeders to the membership and work of T.A.P.P.I. He instanced the work of the Pacific Coast section which was not yet nine months old and has a membership of 75. The organization of this section was described in the October and November, 1929, issues of the paper industry periodicals. He gave some particulars of the by-laws governing the organization of territorial groups. To form a section of the association, application must be made to the Executive Committee, signed by three T.A.P.P.I. members. The group must be officered by members of T.A.P.P.I. and be selfsupporting, a certain proportion of the dues being refunded to the local association to help meet running expenses.

The T.A.P.P.I. Fellowship at Madison—The T.A.P.P.I. fellowship at the Forest Products Laboratory, Madison, Wis., which was sponsored by the executive committee of the association last year, was touched upon in the address. The association had undertaken to set aside $1,000 annually for three years to be used for research work at the Forest Products Laboratory with the understanding that additional funds would be provided by the American Paper and Pulp Association, details concerning the administration to be left to the advisory committee of the A.P. & P.A. Under the operation of the fellowship, progress had been made in determining the physical law governing the relation between the structural strength of a sheet and the percentage of solids by volume in it. From this it would be possible in the future to tell from pulp in suspension what the properties of the paper would be.

Attention was called by President Glatfelter to the new Institute of Paper Chemistry which had been established at Lawrence College, Appleton, Wis., under the direction of Dr. Otto Kress. The institute will train chemists to fit them especially for the work of paper technology. In addition to an undergraduate course, postgraduate work will be conducted at the Institute of Paper Chemistry which is advantageously situated for access to mills in the Fox River Valley district. President Glatfelter said that our industry was fortunate to be put in the way of obtaining capable men of scientific and practical training, and he paid tribute to Ernst Mahler, D. Clark Everest, Hugh Strange, L. M. Alexander, D. K. Brown and M. A. Wertheimer who had made the institution possible, with the co-operation of Dr. H. M. Wriston, president of Lawrence College.

Service to Members—In a reference to the value of the service to members feature of the association's work, it was pointed out that generous contributions of valuable information had been made. The service was available to all members who replied to questionnaires, only those who contributed of their services being entitled to receive the information given by others.

Advocates More Test Methods—President Glatfelter made a plea for increased attention to the improvement of methods for the evaluation of pulp quality as well as methods of paper testing. The work already accomplished had been commendable but more was expected during the coming year.

In closing, he reviewed some of the work that he deemed necessary for association members to engage in. Among the points brought out were the necessity for increased membership, especially among mill superintendents and mill engineers; the development of stronger committee and sectional organizations; improved service to members' reports by everyone co-operating in supplying data, and finally more complete and satisfactory methods for the evaluation of pulp quality and paper testing.

Secretary-Treasurer's Report

Secretary R. G. Macdonald was called upon for his report as secretary-treasurer. He read a prepared statement dealing with membership statistics, special reports, sectional organization and several other activities of the association that are usually considered in a presidential address.

Foreign Membership—In regard to membership it was noted that 194 members had joined in 1929, the total membership on December 31, 1929, being 1,033, comprising 666 active, 265 associate and 102 juniors. During the year, 63 members had been dropped or had resigned, and 3 members had died. The corporate membership now numbered 89, 21 paper companies having been added during the year. Mention was made of the international aspect of the growth in membership during 1929. A large number of the new members reside in Canada, Great Britain, Sweden, Norway, Finland, Germany, France, Italy, Switzerland and Russia or the Union of Socialist Soviet Republics. The technical organizations in

most of these countries had extended an invitation to the members of T.A.P.P.I. to join their organization.

Service to Members Reports—Under special reports, Secretary Macdonald dwelt on the character of the service to members' reports. The original plan of the association to be a clearing house for the exchange of information was encouraged by the service to members reports, manufacturing and other technical problems of individual and company members being received and presented to the entire membership for consideration. Except for corporate members, only members who contribute information are eligible to receive the compiled transcripts of replies to inquiries. In the case of some corporate members, the inquiries sent out by T.A.P.P.I. are distributed to superintendents and others in the mill deemed qualified to report on the subject. The replies are then edited and a composite company report is delivered to the association. Some fifteen special reports were issued in 1929.

Praise for Fall Meeting—The fall meeting of the association held at Richmond, Va., last September came in for praise. "Under the able chairmanship of B. K. Steadman, chief chemist of the Standard Paper Manufacturing Company, the local committee prepared and conducted one of the best meetings the association has ever held."

Co-operation with Other Societies—The co-operation of T.A.P.P.I. with other associations was discussed in the secretary's report. The association is represented, with the American Paper and Pulp Association and the American Pulp and Paper Mill Superintendents' Association, on the Joint Educational Committee of the Paper Industry. The Power and Mechanical Engineering Committee is working with the Hydraulic Society in a study of the loss in head caused by friction of pulp flowing through pipes.

The Science Advisory Committee of the National Research Council is at work on a plan of exhibit for the paper industry at the Chicago World's Fair in 1933 and a committee of co-operation consisting of Allen Abrams, chairman; R. A. Hayward, H. G. Ingraham and W. G. MacNaughton was appointed by President Glatfelter.

Details of the American Scandinavian Foundation were given and reference was made to the conduct of an employment exchange in the secretary's office without charge to companies or individuals.

In a reference to the publications issued under the auspices of the association, mention was made of C. J. West's "Bibliography of Papermaking, 1900-1928." The reception of the book had not been up to expectations, more than half of the issue remaining unsold. The cost of the book was low, Secretary Macdonald said, and it should be in the library of every paper mill and papermaker.

Reference was made to the investigation under way at the Forest Products Laboratory in connection with the research fellowship financed by the association in conjunction with the American Paper and Pulp Association. The project now being worked upon at the laboratory, with Randall H. Doughty, holder of the fellowship, was designated under the general title of "The Relation of Sheet Property to Fiber Properties Through Sheet Structure."

Committee Activities—Three committees—to-wit, those on corrosion and alkaline pulping processes and physical standards for pulp, have conducted surveys and collected information of value. The Alkaline Pulping Processes Committee is covering the field formerly handled by the committees on soda pulp and sulphate pulp, while the Committee on Physical Standards is studying the problems of pulp evaluation for strength which was previously considered by the sulphite pulp committee.

The Paper Testing Committee had prepared revised methods for estimating fiber, paraffin and starch in paper. The proposed changes were favorably voted on by the association, thereby making them official paper testing methods of T.A.P.P.I.

A special committee on Permanence and Durability of Paper was appointed by the president to review the work being done generally toward the solution of this problem and to prepare a report on this subject that will have the unanimous approval of the committee members.

After an expression of regret at the passing of three members during the year: R. D. Bertschy, president of the Miamisburg Paper Company; C. F. Sammet, chief chemist of Crane & Company; and O. S. Egan, technical director of the Consolidated Water Power and Paper Company, Secretary Macdonald acknowledged the wholehearted co-operation that he had received from a large number of members during the year.

Committees Heard From

Cellulose Committee Report—Committee reports were then taken up, Dr. John L. Parsons making a statement for the Cellulose Committee of which he is chairman. As one of the objects of the Technical Association was the encouragement of original investigation and research work in the chemistry of cellulose and its associated materials, the Cellulose Committee had deemed it desirable to present and discuss papers on aspects of both pure and applied cellulose chemistry of interest to pulp and paper technical men. He mentioned that in the field of pure chemistry, Dr. Harold Hibbert, professor of industrial and cellulose chemistry at McGill University, would discuss "Recent Work in Connection with the Structure of Lignin," a substance which while familiar to all pulp and paper chemists was one the least understood. In the field of applied cellulose chemistry, two contributions would be offered, one on "Vulcanized Fiber Manufacture; Its Problems and Paper Requirements," by Dr. F. L. Simons and the other on "The Raw Material and Manufacture of Cellophane," by T. G. Finzel. These papers, Doctor Parsons said, would describe some of the newer uses to which cellulose in one form or another has been put and would serve to indicate the ever broadening industrial application of the world's most abundant vegetable raw material to which the pulp and paper chemist must give greater cognizance.

Standard Analytical Methods—He said that during the past year reprints had been distributed to members of T.A.P.P.I. of tentative standard analytical methods for the determination of alpha cellulose and the viscosity of cellulose in cuprammonium solution, the work of Ritter, Carver and others of the Division of Cellulose Chemistry of the American Chemical Society. Doctor Parsons said that his committee would be very appreciative of learning the experience members have had with these two analytical methods and would also welcome suggestions regarding its work.

Work of the Alkaline Pulping Methods Committee

E. S. Hinman, chairman of the Alkaline Pulping Committee, reported on work accomplished during the year in the way of research and the collection of facts through questionnaires. He said that the research problem now under study with the co-operation of the Forest Products Laboratory dealt with the critical temperature at which longleaf pine should be pulped to produce the maximum yield, consistent with pulp quality and good bleachability. Reports of this work would be given at the sectional meeting by staff members of the Forest Products Laboratory.

Meager Replies to Questionnaires—A questionnaire on "Wood Measurement" had been sent to 300 pulp mills in the United States to which thirty-eight answers had been received, representing only 12.7 per cent of the methods in use and it was difficult to form an opinion from such a limited number of replies. Better returns had been received from a questionnaire on "sulphidity," ten out of thirty-four mills replying. The replies to both questionnaires are to be compiled and distributed to contributors. He asked for a fuller measure of co-operation from members in the work of the committee. The committee is now endeavoring to co-operate with the standing committee on sulphate, soda and kraft pulps of the Technical Section of the Canadian Pulp and Paper Association in order to avoid duplication of effort.

Corrosion Committee

For the Corrosion Committee, J. B. Miller, chairman, gave an outline of the field of activity covered by the committee. During the past year this had been confined largely to process equipment of the sulphite industry.

Work of the Paperboard Committee

After Jessie E. Minor had given an outline of the subjects to be discussed by the Fine and Special Papers Committee of which she is chairman, C. C. Heritage, chairman of the Paperboard Committee, reported. He described the organization of his committee into three subcommittees to cover the three major fields of work. Subcommittee No. 1 has to do with paperboard quality and converted products under the direction of E. F. Whittington, of the Sutherland Paper Company. Subcommittee No. 2 led by George R. Wyman, of Bird & Son, has for consideration the field of the cylinder machine, while subcommittee No. 3 dealing with raw materials and stuffs has Arthur R. Harvey, of the Gardner & Harvey Company, as chairman.

Quality Sacrificed—Mr. Heritage's report had been published a week in advance of the meeting. It discussed the use requirement for paperboard, stuff preparation and developments in paperboard manufacture. According to this report the quality of paperboard in general has been affected adversely by the demand of the buyer for lower prices, and quality is not now the prime consideration. The conclusion of the committee is that buyers need education in the merits of quality products in the paperboard field.

Physical Standards for Pulp

Donald E. Cable, chairman of the Committee on Physical Standards for Pulp, was then called upon for an outline of the work of his committee. He said that some delay had arisen in the preparation of the report but that the committee had reached some important decisions covering details of how to make up standard test sheets, which would be discussed in the sectional meeting on Wednesday afternoon. He called attention to a foreign publication of great value entitled "Interim Report of the Pulp Evaluation Committee to the Technical Section of the Paper Makers' Association (of Great Britain and Ireland)," and took occasion to thank Arthur Baker, chairman of that committee, for having provided the corresponding American committee with a copy of this book.

Attention was also called by Chairman Cable to the paper on "Strength Testing of Woodpulp," by H. A. Rothchild, Ivar Lundbeck and D. E. Cable which would be presented later.

Power and Mechanical Engineering Papers

For the Committee on Power and Mechanical Engineering, F. J. Rhoades, chairman, listed the papers to be presented at the sectional meeting. These included C. F. Rasmussen's "Gradual Temperatures in Paper Drying"; "Heat Requirement for Machine Rooms," by A. E. Montgomery; "Steam in Paper Mills," by F. E. Winslow and W. C. Newman; "Modern High Pressure Steam Generation," by J. B. Crane; "Efficient Drying of Paper," by E. W. G. Cooper; "Modern Stoker Fired Steam Generating Units," by J. E. Worker; "Vertical Jet Combustion," by Douglas Henderson.

B. W. Scribner, chairman of the Paper Testing Committee, announced the program for the afternoon meeting, calling special attention to K. P. Geohegan's paper on "The Use of Chemical Microscopy in the Paper Mill," and "New Wrinkles in Paper Testing" by Edwin Sutermeister and L. W. Porter.

George K. Spence, chairman of the Stuff Preparation Committee, called attention to the meeting of his committee for Thursday morning.

R. S. Kellogg reported for the Textbook Committee, substantially as given before the Canadian Pulp and Paper Association which was published in last month's issue of THE PAPER INDUSTRY, page 1961. Since that report was made, another royalty check of $900 had been received which had enabled the committee to invest in another $1,000 bond.

J. Newell Stephenson, Montreal, editor of the textbooks, announced that he had received a letter from the director of the French School of Papermaking at Grenoble advising that the French translation of Vols. III and IV had been adopted as standard textbooks by the school.

To Show a Century of Progress

Allen Abrams reported for the Chicago Century of Progress Committee, giving particulars of the exhibition which has been planned for 1933 in Chicago to commemorate a century of progress. Details were given of the projected scheme of exhibits to demonstrate progress in paper manufacture during the past hundred years. A small working model of a paper machine will be operated. In addition to specimens of pulps and papers, raw materials, etc., an exhibit of testing instruments will be made. The T.A.P.P.I. Committee in charge of the papermaking exhibit consists of H. G. Ingraham, engineer with V. D. Simons, 435 North Michigan Ave., Chicago; Kenneth T. King, sales engineer, E. I. du Pont de Nemours & Co., 1114 Union Trust Building, Chicago; W. G. MacNaughton, Department of Manufacturing, International Paper Company, New York, and Allen Abrams, technical director, Marathon Paper Mills Company, Rothschild, Wis.

Chair Appoints Nominating Committee

The next business taken up was the appointment of a nominating committee to submit names of officers to serve during the ensuing year. On this committee the chair named Fred C. Clark, chairman; B. T. McBain and E. S. Hinman, with instructions to report at the luncheon meeting on Thursday afternoon.

W. N. Millspaugh Describes His New Machine

The regular program was then taken up and W. H. Millspaugh was asked to present his paper on a new vacuum forming paper machine, which he did by comparing its operation with cylinder and fourdrinier machines, calling attention to differences and similarities.

The machine is still in process of development, according to Mr. Millspaugh, who said: "There are innumerable combinations to adapt the apparatus to the intended use; single, duplex, triplex or many plies, heavy and light papers, speed, etc. Wires and felts will be arranged differently as the needs of the customer are to be met; vats and flow boxes changed, adjusted and designed for the different needs."

He described the new machine as "a large perforated shell suction roll having square countersinks to secure maximum drainage; a short wire made endless passes over the suction roll and away from it in any of the many directions the particular service dictates. It is tensioned and guided in the same way as a fourdrinier wire. The vacuum compartments of the suction box or boxes within the perforated shell are arranged to form the sheet with slight initial pressure, or only by the head of stock, increasing the pressure by steps as the formation proceeds, or by one constant pressure as the character of the sheet being formed demands. After the sheet has been formed in this way, high vacuum is used if the sheet is a single ply, much as with suction couch rolls of fourdrinier machines.

The Wet End—"The forming box and vat are simple and are placed directly against but not in actual contact with the forming roll. After the proper amount of pulp is deposited, it is held firmly by vacuum on the wire as it emerges from the vat, regardless of the speed of the machine . . . When making a single-ply sheet, the lay of the fibers is normally with the run of the sheet, but their disposition may be changed by mechanical means. A sheet may be made duplex with wire sides in or wire sides out, as desired, by proper arrangement of wires and felts.

"The individual sheets are transferred from the forming wires to the felt by a suction roll, called a transfer roll. Usually two sheets are united on the wire before transfer to the felt, but they may be united on the felts before passing into the suction presses. The formation of the sheet is controlled by vacuum, as is the transfer of the sheet from the wire."

The Dry End—Mr. Millspaugh further explained that the machine took up very little room, three rolls instead of four being used. The sheet is taken from the top plain roll in the ordinary manner to dryers fitted with rope carriers. The dryers are mounted on anti-friction type bearings, and in the case of the machine now being operated at Sandusky, this has twenty dryers, each 4 feet in diameter. Two of the dryers at one end of the machine are geared together in the ordinary manner, top and bottom. All other dryer gears are omitted and because of this the rear of the machine is as accessible as the front. No difficulty has been noted in driving the

dryers with felts, the draw of the paper being perfect. He said there was no doubt of the practical utility of the machine in the manufacture of many grades of paper, boxboard, roofing felts, etc.

Does Not Expect Quick Acceptance—Mr. Millspaugh closed by saying that he did not look for a quick acceptance of the new machine in all its features, as he was aware how long it took to convince the paper industry of the utility of suction couch and suction press roll on fourdrinier machines.

Discussed by Members

In the discussion which followed, many questions were asked of Mr. Millspaugh. W. W. Cronkhite asked if any tendency of the dryer felts to creep to one side had been noted, and was answered in the negative.

Influence on White Water Problem—R. S. Kellogg made inquiry as to the effect the new machine might have on the white water problem and was told by Mr. Millspaugh that as white water, so called, falls within the forming part of the machine it is passed back into circulation, going straight to the mixing box. Very little shower water was required on the machine and the question of overflow or waste of white water was therefore simplified.

Mr. O'Connell asked if a better formation was attained with the new machine than with a cylinder machine, and the secretary made inquiry as to power consumption.

Mr. Millspaugh said he was not in a position to discuss some of the technical features of the machine and would prefer to leave such discussion to the new owners. When he left the company six weeks ago no figures on the power consumption was available.

Mr. Cronkhite asked if tissue paper could be made on the new machine and was told by Mr. Millspaugh that it was not especially adapted for certain papers as a few details had yet to be worked out.

To an inquiry by J. N. Stephenson concerning the moisture content held by the sheet going to the dryers, Mr. Millspaugh said that the sheet passed through two felts and showed a remarkable increase in the dry content.

Mr. Stephenson was not satisfied with this answer and said, "In making newsprint, 30 per cent is considered high, what was your percentage?" Mr. Millspaugh said that his machine yielded a sheet 34 to 36 per cent dry but it made a difference what kind of felt was used. In ordinary newsprint manufacturing operations, 31 per cent was considered high, 27, 28 and 30 per cent being commoner as figures of dryness.

In answer to a question by Doctor Campbell as to the maximum speed at which the machine was run, Mr. Millspaugh answered 800 or 900 feet.

Praise for the Inventor—After a tribute by Mr. MacNaughton to the value of Mr. Millspaugh's work in developing a new machine, and a statement by Mr. Traquair to the effect that Millspaugh's suction roll had contributed more to the advancement of the paper industry than any other single invention, new business was taken up.

Chairman Glatfelter called for the reading of a paper on "Developments in White Water Utilization," by C. M. Baker, engineer of the American Paper and Pulp Association.

White Water Utilization

Mr. Baker expressed the opinion that recent developments in white water utilization confirmed the practicability and economy of the closed or substantially closed system. He instanced the results obtained with the use of a closed system in board mills, tissue mills, book mills, and kraft mills. One board mill had operated for a number of years on what was substantially a closed system, the white water from several machines being collected in a common pit from which it was pumped to a sidehill save-all. The effluent from this save-all, after recovery of most of the stock, is led by gravity through a sedimentation type of save-all to a sump from which the mill water supply is taken. White water as it reaches the sidehill save-all, contains about 8 lbs. of stock per 1,000 gallons, half of which is recovered and returned to the stock chest. Whatever stock remains is recovered in the sedimentation save-all and used in the beaters. Slime is controlled by a chlorinating system.

Recirculation Through Showers—Mr. Baker mentioned another board mill which has reduced its water consumption by recirculation of the white water from the fan pumps directly through the cylinder mold showers. The openings of the showers were enlarged and directed tangentially to the surface of the cylinder so that accumulated material might be washed off rather than through the wire.

Efficient Working of Closed System in Tissue Mill—In the manufacture of tissue paper, a closed system worked nicely, according to Mr. Baker. In one tissue mill instanced by him, the effluent from the save-all was returned directly to the machine as its source of water supply and the recovered fiber to the stock chest. In another tissue mill, the method adopted was to collect the white water from machines running various colors in a common pit and pass the whole through a single highly efficient save-all. Recovered stock went to the groundwood chest, while the effluent water becomes the mill water supply.

The Age-Old Objection to Change—Mr. Baker gave a revealing instance of the difficulties encountered at some mills in closing the white water system. One mill manager turned the problem of white water utilization over to an engineer with practically no knowledge of papermaking and told him to develop a closed system on a designated machine. The engineer changed the piping in the basement so as to pass the white water through a save-all and return the effluent to the machine. Fresh water was shut off so that none could be obtained by the machine operators. The machine was operated for several weeks in this manner and during this time the manager made it his business to pass through the mill and asked the machine tenders how they were getting along. Invariably he was told that difficulties were encountered because of too much white water.

Without saying anything about it to the machine tenders, the mill manager instructed the engineer to change the system secretly during the week-end so that nothing but fresh water reached the machine. This was after the machine had been running three weeks on a closed system. During the following week, the manager went through his regular routine of visiting the machine daily and asking how things were going. He got the same responses as before—difficulties were being experienced on account of too much white water. At the end of the week he called all the men to his office for a conference. After getting confirmations from them of their previous statements, he proved to them that they had had no white water for a week. That mill is now operating on a closed system!

Of Great Benefit to Book Mills—Book paper mills benefit greatly by the introduction of closed systems. While sedimentation save-alls have been favored because of the large amount of filler used in making book paper, some mills have installed superior mechanical save-alls. Mr. Baker reporting that one book paper mill had reduced its water consumption and white water waste to about 1,300 gallons per ton of product.

Two Kraft Mills Contrasted—The instance was cited of a kraft pulp mill that purchased its water from the city authorities at a cost of about $150 daily, the consumption of water amounting to 60,000 gallons per ton of product. He contrasted this with another kraft mill that used less than 20,000 gallons of water per ton of pulp for all purposes, including the pulp mill, paper machine, boiler and other uses, as the result of reuse of white water. A commensurate reduction in the first mentioned mill would result in a saving of $100 daily.

Every News Mill Should Have a Closed System—As to newsprint mills, recirculation was being successfully carried on in a number of them. In fact, as he said, there should be no white water wasted from a paper machine operating on newsprint. The excess white water due to slush stock brought over from the pulp mill could be returned to the pulp mill for washing pulp and feeding the grinders.

Waste in Fine Paper Mills—Despite the fact that the value of white water waste was greater in fine writing paper mills than in any other grade of papermaking, on account of the

discharge of good rag stock, less effort was made at recovery through the use of save-alls than in other mills.

Applicable to All Mills—Summarizing his observations, Mr. Baker said that a closed white water system was applicable to every classification of the industry without danger of any deleterious effect on the product. The more concentrated white water from the wire trays and suction boxes should be used as beater make-up, but white water should be used on all wire and cylinder showers. Where high efficient save-alls are used, the effluent may even be used on felts.

Application and Direction of Showers—Mr. Baker has observed that showers give better results when directed tangentially rather than perpendicularly to the surface, so as to wash off rather than through the wire or felt, except where placed on the opposite side of the wire from the accumulation of fiber or dirt to be removed. It was necessary to use chlorination or some other form of sterilization to prevent the formation of slime.

Procedure Recommended—The mill manager who is considering the introduction of a closed white water system should, Mr. Baker said, decide about adopting some such procedure as is outlined in the following steps:

1—A white water survey is first necessary to determine the existing losses, and the extent to which expenditures for their recovery are economically feasible. Furthermore, such surveys are desirable as improvements are made in order to evaluate their results.

2—Reduction of fresh water to a minimum, irrespective of white water utilization is essential both to economize water and simplify the use of white water.

3—Recirculation and reuse of the white water without save-alls is the next logical step. This further reduces the amount of fresh water required, recovers a certain amount of fiber and reduces the expenditure necessary for save-alls and other recovery equipment.

4—Save-all equipment should be the last item of consideration with a view first, of recovering fiber and papermaking materials and returning the save-all effluent to the white water system, and second, of treating any residual white water which it may be necessary to waste.

Progress in Recovering of Chemicals—Mr. Baker gave extracts from another paper, not on the program, relating to conditions in Wisconsin and read resolutions which had been adopted. He said that progress had been made in the recovery and utilization of chemicals, especially of volatile solids, that went to make river pollution.

In reply to questions, he said that white water had been used successfully as a shower on the cylinders without enlarging the apertures or increasing the suction pressure.

T. L. Crossley mentioned the case of a board mill that had experienced trouble from wool fibers separated from the whipper, and Mr. Baker said that this had been brought to his attention as well.

Trouble from Pitch in Closed Systems—Dr. J. Campbell remarked that some of the Canadian mills had experienced trouble in operating a closed system on account of the deposition of pitch on the wires, and Mr. Baker said that similar trouble had been experienced in American mills.

Report on Fellowship Research

C. C. Heritage reported on the work of the American Paper and Pulp Association Fellowship at the Forest Products Laboratory in relation to the research selected, which, it was stated report had reference to the relation of sheet properties to fiber properties through sheet structure. In an introductory statement, it was noted that the pulp and paper industry dealt essentially with four materials—the sheet, the stuff, the pulp and the wood, each of which was related through the variables of the processes by means of which they are transformed one into another. Upon the ability to evaluate these materials depended knowledge of what took place in the manufacturing process.

Sheet Structure Important—In considering the relative importance of each of the four materials named, the sheet was given first place. The physical properties of the sheet were considered of greater importance than the chemical properties and the research study was confined to this. In defining physical properties, a classification was attempted of those pertaining to the surface and those pertaining to the entire sheet. Color and finish, he said, were typical of surface properties, while the structural properties related to the penetration of liquids and the various strengths and rigidities of the sheet. The structural properties were selected as subjects of study.

Structural Properties—Mr. Heritage said that structure could be resolved into two major elements consisting of the percentage by volume of solids and the fiber arrangement. It was taken for granted that the properties of a sheet were related to the properties of the fibers of which it is made, but the same fibers or stuff going on the wire may produce sheets of different sheet properties, depending upon the manipulation of the variables of the paper machine. On the other hand, different stuff going on the wire may produce sheets of different sheet properties if the variables of the paper machine are held constant. The paper machine controls only the structure of the sheet; that is, its volumetric composition, fiber arrangement and caliper.

Definitions of Paper Strength—Mr. Heritage's report stated that the research study dealt particularly with strength phenomena. Several kinds of strength are recognized by engineering theory, but the report concerned itself with strength in tension. Four manifestations of tensile strength were noted, as sheet strength in tension, structural strength in tension, formation strength in tension, and potential fiber strength in tension.

Fine Technic Required—Several hypothetical considerations were discussed in the report, all of a rather philosophical character and dealing with mathematical relationships. The results to date were stated more or less definitely, though it was noted that the study had not been long enough under way to permit of more than tentative statements concerning work in progress. The studies require fine technic in the preparation of uniform hand sheets, a technic which is acquired only in the course of practice, according to the report.

Practical Considerations—In regard to the practical aspects of the work, the following possibilities were presented, on the understanding that the study did succeed in establishing the relationship sought:

1—Rational evaluation and design of papers.

2—Rational evaluation of pulps using hand sheets.

3—Possible evaluation of pulps in water suspension without the necessity for producing hand sheets.

4—Rational expression of and correlation of the effects of the papermaking variables upon sheet properties.

5—Rational expression of and correlation of the effects of the refining variables upon sheet properties.

6—Rational expression of and correlation of the effects of the pulping variables upon sheet properties.

Mr. Heritage brought the report to a close with the statement that the interest of the paper mill lay in designing and producing a sheet of the requisite strength with the lowest ream weight at the least cost per pound. If the study proved successful, means would be available to select the optimum pulp and the optimum refining and papermaking conditions to produce the sheet properties desired in the most economical manner.

Measuring Opacity or Density of Paper

Frederick A. Pearson, director of the Pearson Research Laboratories, Great Barrington, Mass., was called upon to present his paper on "Light, a New Measuring Rod for Paper," which dealt with the use of photo-electric cells, with special reference to an instrument for measuring opacity which had been developed by him. The idea of this instrument, called an opacimeter, was based on the theory that a photo cell mounted on one side of a sheet of moving paper with a light of constant value directed upon it would give information regarding the density of stock to the papermaker. The instrument was tried out on a paper machine by placing the photo cell under the paper at a point after it had been dried, but before it was sized. Subsequent developments indicated that it would be necessary to arrange the light and cell so that they could be moved across the paper machine

and back in order to compare one strip of the total web with another. Lantern slides were used to show the operation of the opacimeter. The instrument was employed in tests on fine paper, but its use on other papers as a measurement of weight and thickness was indicated.

After J. D. Miller, chairman of the Corrosion Committee, had announced the program for the meeting of this committee on Wednesday afternoon, the morning sitting was adjourned.

AFTERNOON SITTINGS

The Committee on Paper Testing, B. W. Scribner, chairman, and the Committee on Training for the Industry, H. G. Noyes, chairman, held meetings in the afternoon in the Grand Ballroom and Exhibit Room No. 6, respectively.

Interest in Paper Testing Methods

Much interest was taken in the papers presented at the meeting of the Paper Testing Committee which was opened with a progress report by Chairman Scribner, who stated that the development of official paper testing methods had received a setback during the year by the resignation of all the former subcommittee chairmen, caused by changes of positions or the demand of other duties. The subcommittees affected were those of Chemical Methods, Grease Resistance and Water Resistance, the new chairmen of which were, respectively P. F. Wehmer, R. C. Griffin and P. W. Codwise. The Committees on Microscopical Methods and Ink Resistance of Printing Papers had not functioned in the interval, owing to the absence of chairmen.

Progress of Revision—Mr. Scribner announced that revisions in the present official methods for fiber composition, paraffin and starch had been adopted by the committee, and he gave a resumé of development work in progress bearing on chemical methods related to the determination of acidity and of starch, as well as the best testing medium for grease and water resistance. Work done under the supervision of E. O. Reed, former chairman of the subcommittee on Ink Resistance of Printing Papers, indicated that the porosity of a paper could be used as a measure of its ink resistance. In announcing the papers to be presented at the afternoon meeting, he called attention to the one by Edwin Sutermeister and L. W. Porter on "New Wrinkles in Paper Testing," and said it was becoming more and more the custom to waterproof coatings.

Tests for Paper Coatings

Mr. Sutermeister traversed the main features of the methods described in his paper, for the analysis and removal of waterproof coatings, the detection of glue in the presence of casein and a splitting test. In regard to waterproof coatings, he said that a paper was occasionally found with the coating so thoroughly waterproofed that the ordinary method of treating the surface with hydrochloric acid followed by ammonia was ineffective. Paper coatings of casein are rendered waterproof by treatment with formaldehyde. Under ordinary conditions, a coating of this kind can be removed by immersing the coated paper in a solution containing 1.5 to 2.0 grams of trypsin and 25 cc. of tenth-normal caustic soda per liter of solution. This is kept at a temperature of about 40 deg. C. for two hours when the coating can be removed by a camel's-hair brush and a stream of water.

An Expectional Coating—Mr. Sutermeister instanced a case where a coated paper had been kept in an atmosphere of formaldehyde gas for a month and the coating had proved resistant to the trypsin treatment which indicated that the method had its limitations.

Detection of Glue in Casein Coating—An interesting process for the detection of glue in casein was described by him. The method is based on the knowledge that both glue and casein can be rendered insoluble by treatment with formaldehyde, and that the compound formed with glue is broken up on boiling with diluted hydrochloric acid. Details of the method were given as follows:

Treat the paper to be tested with formaldehyde gas in a closed jar overnight, or until no test can be obtained by boiling the paper in water and adding Schmidt's reagent (acid ammonium molybdate) to the solution. Tear 0.5-1.0 gram of the formolized paper into small pieces and boil 2 minutes in 15-20 cc. of hydrochloric acid (1 vol. concentrated acid and 4 vols. water). Decant the solution, make slightly alkaline to phenolphthalein with caustic soda, and then just neutralize with hydrochloric acid. Filter and add Schmidt's reagent to the filtrate. Glue gives a precipitate, while casein and starch give none.

Interfering Substances—While satin white in a coating tends to make the casein insoluble, boiling water will usually dissolve enough to react with molybdate. Treatment with formaldehyde, however, prevents this.

A Splitting Test for Paper—The authors gave a test to indicate the force with which the fibers adhere to each other. A Schropper tensile tester can be used in determining this property, two brass blocks, 1 in. sq. and ¼ in. thick being used with hooks passing through the center which are fastened to the jaws of the tester. The paper to be tested is glued to the blocks by means of waterglass. Too much silicate must not be used as an excess soaks into the paper and spoils the test. A table of results showed the magnitude and uniformity which might be expected in the case of book papers, the figures representing pounds per square inch. On English finish No. 1 paper, the average was 35.9, and on No. 2 machine finish, 27.9.

Bursting Strength Test

In the paper by F. T. Carson and F. V. Worthington on "A Study of the Bursting Strength Test," which was presented at the afternoon sitting of the Paper Testing Committee on Tuesday, possible sources of error in test factors were considered and an attempt made to correlate bursting and tensile results. The conclusions of the authors of the paper were stated as follows:

(1) The bursting strength is determined by the tensile breaking strength and the elongation at rupture in the machine direction.

(2) The cross direction properties of paper do not appreciably influence the bursting test.

(3) If any two of the three properties, tensile breaking strength (machine direction), bursting strength, and elongation at rupture (machine direction) are known, the other can readily be calculated.

(4) Nothing is measured by the bursting test which could not be determined by the tensile test.

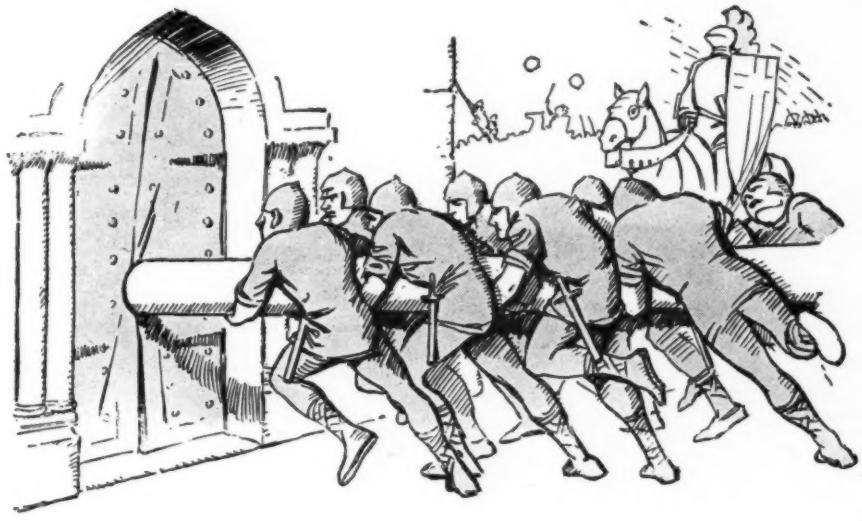
(5) The bursting test measures the strength of paper in the stronger direction only and is therefore inadequate for the specification of the strength of many types of paper.

(6) Values for the elongation at rupture, which are frequently not recorded in tensile tests, may be calculated if the bursting strength is known.

(7) Data obtained with different bursting testers, which are comparable in all respects except for size of bursting orifice, may be correlated on the thesis that the bursting pressure for a given paper is inversely proportional to the orifice diameter.

Comparison of Sizing Characteristics

One of the papers presented at the afternoon sitting of the Paper Testing Committee by Philip W. Codwise on "Determination of Surface Sizing" was read by title in the author's absence. It was concerned with details of a method of quantitatively comparing the sizing characteristics of paper surfaces. The test is made by applying to the surface of the paper under examination a cubic centimeter of distilled water at 70 deg. Fahr., the water being delivered from a 1 cc. pipette placed with its tip just above the surface in such a way that the tip remains immersed in a drop as the water discharges. This forms about a ¾-inch circular spot. The large drop is carefully watched for indications of feathering out, or spreading beyond the boundary of the drop. A stop watch is used to measure the time. Upon newsprint the feathering takes place in two seconds, but with some wrapping and writing papers which are hard sized, no spreading may be observed after twenty-four hours. The procedure is said to have the merit of simplicity and of giving a direct numerical expression of the results. Mr. Codwise gave a comparison of results with three different typewriter papers. Sample 1 showed no feathering or spreading after twenty-four hours exposure to the blob of water, while No. 2 feathered after ten minutes exposure, and No. 3 in two



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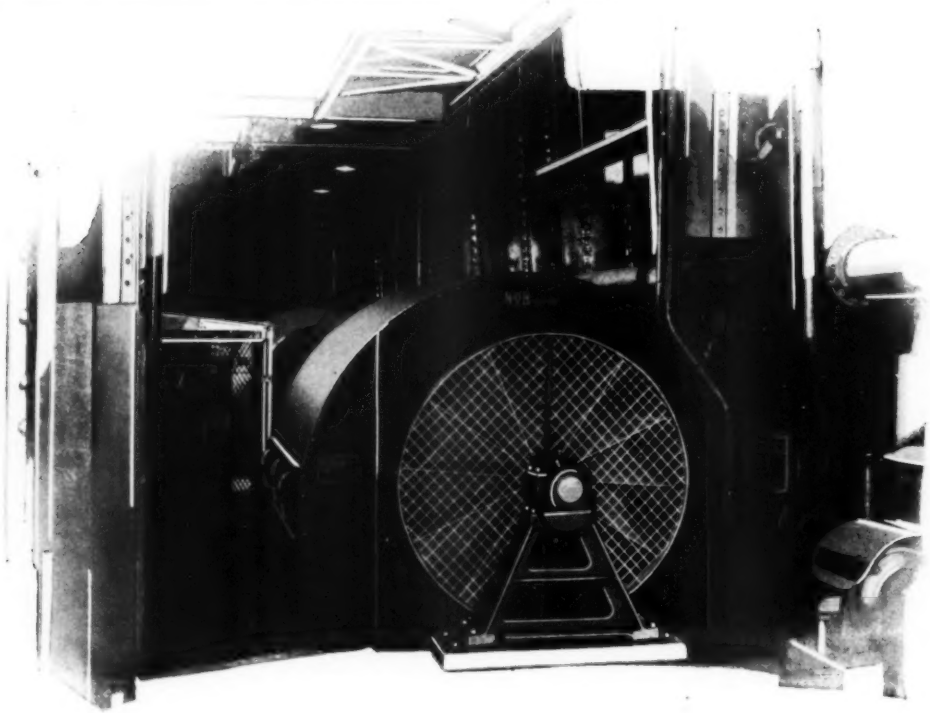

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seconds exposure. It was evident that sample 3 was slack sized; that sample 2 had a moderately sized surface, and that sample 1 was very well sized.

Chemical Microscopical Tests

A paper of unusual interest and value was presented by Kenneth P. Geohegan, chemist with the Aetna Paper Company, Dayton, Ohio. It dealt with the reactions observed in chemical microscopy, which make for extreme rapidity of work, a few minutes at the microscope often taking the place of an hour with test tubes and breakers. The great exponent of chemical microscopy in the United States is Dr. E. M. Chamot, professor of chemical microscopy at Cornell University, and the standard textbook is the **Handbook of Chemical Microscopy** by Chamot and Mason in two volumes. Volume I treats of the "Principles and Use of Microscopes and Accessories, and Physical Methods for the Study of Chemical Problems." Volume II has not yet been issued. It will give "Chemical Methods and Inorganic Qualitative Analysis." There are a number of other publications that may be consulted by chemists who wish to take up chemical microscopy.

Practical Application of Chemical Microscopy—Mr. Geohegan's paper was intended to furnish a general idea of the methods of microscopic qualitative analysis in its application to the identification of paper fillers. He enumerated some of the uses of the microscope in a paper mill laboratory, besides describing methods of identifying paper fillers. Having obtained the ash, a small amount of it is added to a drop of dilute hydrochloric acid on a microscope slide, watching for the effervescence that would show the presence of carbonates. The slide is then heated over a micro-burner and allowed to cool, when calcium sulphate will separate if present. If no crystals of calcium sulphate appear, a test for calcium is made by adding a little sodium sulphate to a portion of the drop. If no calcium is present, another portion of the drop is tested for sulphates by adding a little calcium acetate or by allowing to flow into the drop a solution of barium chloride, and so on for aluminum and other minerals. He sought to demonstrate that the method of microscopic qualitative analysis was much more rapid and comprehensive for the identification of paper fillers than any of the customary procedures as laid down in **T.A.P.P.I. Paper Testing Methods**, and he expressed the hope that it will be possible ultimately to include the microscopical methods among the official testing procedures.

Time Saving Methods of Analysis—Mr. Geohegan said that in his work at the Aetna Paper Company he had found the chemical microscopic method to be quite practical and a saver of time, besides furnishing information that could not be obtained by qualitative analysis alone. He advised his hearers to read Chamot and Mason's **Handbook of Chemical Microscopy**, published by John Wiley & Sons, Inc., New York.

Training for the Industry

A separate meeting was held of the Committee on Training for the Industry at which the annual report of Chairman H. G. Noyes was presented. During the year, the United States was for the purposes of the committee divided into ten areas, each of which was in charge of a T.A.P.P.I. member. Thus Maine and New Hampshire were combined, with Fred W. Motschmann, director. Massachusetts and Vermont were similarly united to form one area, with L. M. Yoerg in charge. New York State was centered at Syracuse, C. E. Libby, director. Pennsylvania had M. A. Krimmel of Erie in charge. John D. Rue directed the work in Virginia and North Carolina while he was employed at the plant of the Champion Fibre Company. For Ohio and West Virginia, listed as one area, J. J. O'Connor was director. Indiana and Illinois, A. E. Bentham. Michigan, M. D. Bardeen. Wisconsin and Minnesota, A. T. Gardner. The division of Washington, Oregon and California was unrepresented, no area director having been chosen for this district.

Establishing Contacts with Mills and Schools—A survey of the mills operating in the several areas was made and arrangements conducted for the placing of students in mills during the summer months. Contact was established by the committee with the dean or heads of departments in the engineering schools within the areas served by the various members of the committee. While most of the schools and colleges co-operated readily with the committee, there were some schools and universities operating placement departments which made it unnecessary to co-operate with the committee. In instances some of the mills were prevented from taking on students recommended by the committee because of the employment of local students who took the job for the sake of the money in it and with no desire of continuing in the industry after being graduated.

Committee Recommendations—Chairman Noyes made a number of recommendations that were calculated to facilitate the work of the committee. Thus direct contact with the American Paper and Pulp Association in securing the co-operation of the management in the work of the committee was recommended, as well as contact with the Superintendents' Association in order to get the support of operating superintendents in the placement, supervision, and follow-up work of the committee. It was recommended that the Joint Educational Committee representing the three associations work with the Committee on Training for the Industry during 1930, as an advisory committee.

Papers on Power and Mechanical Engineering

Simultaneously with the Paper Testing meeting, at 2 o'clock on Tuesday afternoon, the Committee on Power and Mechanical Engineering met and listened to papers and discussions on the drying of paper.

The Gradual Drying of Paper

C. F. Rasmussen, president of Rasmussen & Co., engineers, Chicago, described a process of drying paper which provided individual control of the steam in each dryer drum. By means of a chart he showed the process steam requirements for a typical paper mill. By this it was indicated that out of each nine pounds of process steam required for each pound of paper manufactured, four pounds or four-ninths of the total are required for drying, which, stated differently, indicated that it required almost half as much steam to dry the paper as for all other processes together. With a 50-ton machine, with a rate of four pounds of steam per pound of paper dried, and steam at $0.40 per 1,000 lbs. and 300 days operation a year, the annual cost of steam for drying amounted to $48,000.

In an enumeration of the essentials of efficient dryer operation, Mr. Rasmussen set forth the following propositions:

1. Each dryer must be in good condition mechanically, the inlet and outlet pipes, valves and syphons must be in order, and the shell must be smooth and bright with a fairly uniform thickness. The condition of the shell is very important.
2. The dryer section must be properly hooded and ventilated.
3. Accumulation of air and water in the dryer must be prevented, and steam must not leak through the system without doing useful work.
4. The temperature of the individual dryers must be correctly graduated in relation to adjacent dryers so that the paper will be dried at the ideal rate as it passes through.

Importance of Air Removal—Assuming that the first two conditions noted above were satisfactory, Mr. Rasmussen dealt with the importance of removing air from the inside of the dryer with positive steam circulation, and he illustrated this and the equipment advocated by him for controlling the quantity of steam to each dryer by means of charts and drawings. He is an advocate of low temperature in drying so as to prevent undue shrinkage of the sheet, minimize snapoffs, besides eliminating cockles and other evidences of incorrect drying. The success of the Minton vacuum dryer was instanced by him as proof of the important part that low temperatures played in maintaining high quality.

Water Combined with the Fibers—As an argument in favor of the gradual drying of paper, it was stated that in the paper manufacturing operation, during the process of hydration in the beater and jordans, water is thoroughly beaten into the fiber. This water is not, he said, merely mixed with the fibers but becomes a part of the fiber itself, with a conse-

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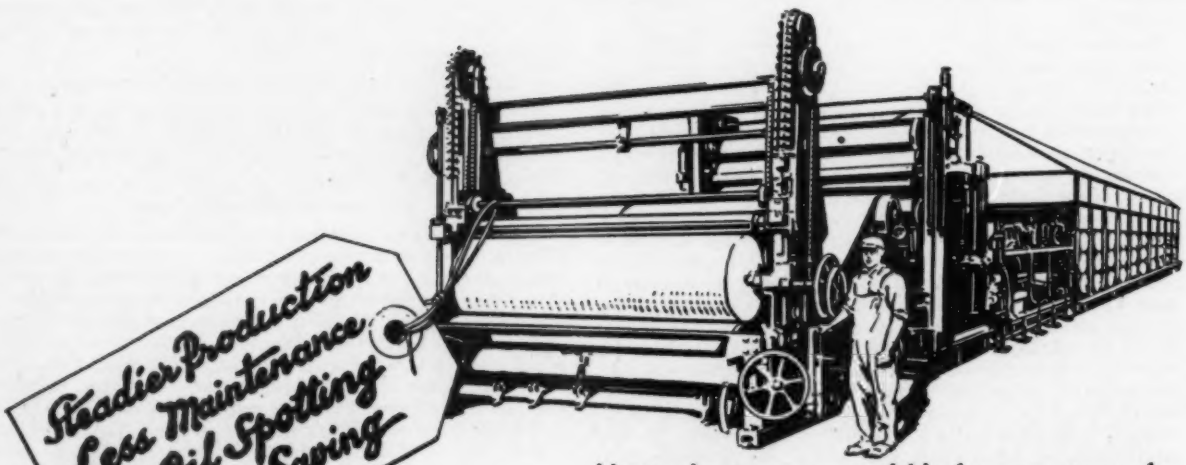

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quent increase in diameter. Proper drying requires that the moisture surrounding the fiber be evaporated, but that which is a part of the fiber itself should remain. If the drying is not properly done from the wet end of the dryer section to the dry end, if the temperatures become so high at the wet end that they generate steam, the fibers will up end, their bond will be destroyed and the web will shrink both across the grain and with it.

With gradual drying, the temperature of each dryer is so regulated that the moisture is evaporated from the sheet only as rapidly as capillary attraction will bring it to the surface. Then when the sheet reaches the end of the dryer section, the fibers are still protected with enough moisture to prevent the removal of the water in the fiber itself.

Observations on Moisture in Finished Paper—Some of Mr. Rasmussen's observations with regard to the proper moisture content of paper going from the dryers to reelers and winders were especially interesting, even if lacking in novelty. Thus, he said that paper should contain about 9 per cent of moisture in the sheet leaving the dryer, for the reason that a certain amount of moisture was required in a good quality of paper, depending on the purpose for which it was to be used. Newsprint, for instance, should contain sufficient moisture to prevent the formation of static on the presses. If static collected in unusual quantities, the sheet became "alive," would not run true, be attracted by iron and steel, and snap off easily. Over-dried paper liberates a fine flour-like dust or fuzz which soaks up ink. He said it was desirable to lower the temperature of the last few dryers so that the sheet would be cooled before entering the calenders. This applied particularly to a sulphite sheet and to kraft.

Heat Requirements for Machine Rooms

The paper by A. E. Montgomery, of the J. O. Ross Engineering Corporation, on heat sources and heat requirements for the paper machine room was of a different character from that of Mr. Rasmussen's. As a basis for discussion, he took B.t.u.'s. As he expressed it, the function of the paper machine was to produce a continuous web of relatively dry paper from a slush stock containing a large amount of water. He referred to the construction of the paper machine as being divided into a wet end where some of the water is removed mechanically and a dry end where moisture is removed by evaporation. It was important that working conditions at the wet end should be maintained at a suitable level to make for efficient control or formation. High temperature, high humidity and dripping at this point were undesirable. Speaking of the heat employed for evaporating water on a dryer, he said that this was usually the largest single heat requirement of the machine room. In most cases the exit temperature of the water vapor was below the evaporating temperature, and this drop in sensible heat loss must be credited to this item, for the lowering of vapor temperature from evaporating temperature to the temperature at which it leaves the machine room was a recovery of heat that was used to heat air for carrying out the moisture. Paper leaving the dryers carries with it a sensible amount of heat, as measured by the excess in exit temperature of fiber, and retains moisture over the evaporating temperature on the dryers, and was an item that was fairly constant from one installation to another, provided the paper be dried to less than 10 per cent moisture content. Another heat loss arose from radiation in the building.

Sources of Heat—As to sources of heat, the major item would be steam sent to the dryers. The net heat from the steam varies with steam temperature and conditions. A third important source of heat supply was heated air used to accelerate drying or to increase machine capacity. Another source of heat commonly overlooked was the heat added to outdoor air by passage through other parts of the mill previous to its use in the machine room. Then there was the heat recovered in the system, under which is included all heat recovered whether made use of directly in the machine room or elsewhere in the mill. The largest amount of heat available for recovery, said Mr. Montgomery, was the latent heat of condensation of vapor removed at the wet end and on the dryers. There were only two practical methods of recovering this heat: one was to heat air; the other to heat water.

Mr. Montgomery exhibited a table that showed heat requirements and heat sources and said he hoped at a later meeting to assign definite values for the items enumerated in these tables.

SECOND DAY'S SESSION OF T.A.P.P.I.

On Wednesday, February 19, meetings of the Power and Mechanical Engineering Committee, the Paperboard Committee, the Committee on Physical Standards for Pulp, the Corrosion Committee and the Cellulose and Fine and Special Papers Committees took place simultaneously in different parts of hotel headquarters and there was also a special meeting of the Committee on Coated and Processed Papers.

F. J. Rhoades, chief engineer of the Mead Pulp & Paper Company, presided at the meeting of the Power and Mechanical Engineering Committee when papers were presented as follows:

Modern Stoker Fired Steam Generating Units, by J. G. Worker.

Modern High Pressure Steam Generation, by J. B. Crane.

Steam in Paper Mills, by E. F. Winslow and W. C. Newman.

Hydraulic Ash and Dust Handling in Paper Mills, by F. B. Allen.

Vertical Jet Combustion in the Paper Industry, by Douglas Henderson.

Professor Hibbert Gives a Lecture on Lignin

At a joint meeting of the Cellulose and Fine and Special Papers Committee in the Grand Ballroom on Wednesday morning, Dr. Harold Hibbert, professor of industrial and cellulose chemistry at McGill University, gave a most comprehensive review of recent work regarding the structure of lignin after a suitable introduction by Chairman Parsons. The various methods that have been proposed for the isolation of lignin from wood were competently described. There is no physical method of isolating lignin from wood. In the case of straw, it is possible to extract lignin in the cold with alcoholic potash solution. Mention was made of the action of bisulphite compounds and treatment with chlorine. Chlorine reacts with moist wood but not with dry wood and further treatment with bisulphite is necessary; lignin may also be extracted with phenol. Freudenberg has removed or extracted lignin from wood by treatment with a 1 per cent solution of sulphuric acid, followed by Schweitzer's reagent.

Professor Hibbert's lecture was rather academic in character, but he took pains to present in as simple and understandable a fashion as possible the various hypotheses entertained by chemists regarding the structure of lignin and the chemical attack on its isolation from wood.

Permanency and Durability of Paper Defined

Some interesting points were brought out at this joint meeting of the Cellulose and Fine and Special Papers Committee when Miss Helen U. Kiely, chief chemist of the American Writing Paper Company, undertook to formulate a definition of permanency and durability of paper. Many of the points brought out by her in a prepared statement elicited keen discussion. Of practical interest was one of the statements made by her to the effect that paper containing any trace of rosin could not be considered permanent. She first attempted a definition of the terms "permanency" and "durability" used generally and often synonymously to express paper quality. The interchange of terms was misleading, she said. Technically there was a difference between permanent and durable papers. A permanent paper was one that should last in the state it was manufactured, while a durable paper must be more than a permanent paper, in that it should retain its original quality under continual usage. A truly permanent paper would not necessarily be a durable paper, Miss Kiely said.

Example of a Permanent Paper—As an example of a permanent paper she instanced filter paper, made from pure cotton rags and entirely free from any chemicals or chemical residues. The trade, however, demands a usable paper and some elements of permanency had to be sacrificed for utility.

Miss Kiely cited the opinion of Doctor Fox, of Cross & Bevan, who has investigated the permanency of paper for the British Government. Doctor Fox is credited with saying that

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any paper with a trace of rosin in it could not be considered permanent, and he was now investigating a metal soap as a sizing agent. This soap would be a stable chemical compound, free from unsaturated hydrocarbons.

The British Government Commission which had investigated paper permanency were credited with making the interesting observation that papers of a date later than 1830 had shown more signs of deterioration than papers made prior to that time. As this was coincident with the introduction of chlorine as a bleaching agent, it was assumed that the use of bleach had something to do with the loss in permanency of modern papers, and alum was also blamed. The British Commission had found that papers used and stored in hot humid climates deteriorated much more rapidly than the same papers in a dryer, colder climate, due possibly to the influence of heat and moisture on chemical residues in the paper.

Miss Kiely expressed the opinion that European papers are never hydrated to the extent of American papers and their deterioration was a result more of oxidation than dehydration, as was the case with American papers.

Chemical Tests Best to Establish Permanency—Chemical tests were of most importance in judging a paper for permanency. A paper to have permanent properties must be made from cellulose of a high degree of purity, since degraded celluloses were unstable and promoted further degradation.

Rosin and Alum Worst Factors—Rosin is deemed the principal factor in paper deterioration, because it is an unsaturated compound which is easily oxidized under changes in heat, moisture and light conditions.

Miss Kiely placed acidity next to rosin in harmful effects on paper. Papers high in total acidity will not stand up as well as the same papers with low acid content, so that a permanent paper must be nearly neutral. Bleach residues and other calcium salts are very harmful.

Fillers Are Protective—The speaker made the interesting observation that tests showed that any neutral filler exerted a protective action and helped the fibers to resist deterioration. Glue and starch gums, not used excessively, increased the strength and durability of a paper.

Application of Chemical Tests—The chemical tests applied to a permanent paper included a determination of the alpha cellulose content, the copper number and cuprammonium viscosity. She said she found the copper number to be of value in determining the degree of bleaching. A high copper number indicated that proper care had not been used in preparing the half stuff. This was not an absolute test, since treatment of the stock with a weak alkali would give a much lower copper number though the stock might have been overbleached.

Physical Tests for Durability—The durability of a paper could be best determined by physical tests and its permanency by chemical tests. Tests made on paper immediately after manufacture and again after a number of years would show conclusively how the paper had lasted in actual use. Unfortunately, she added, the physical testing of paper in its present state of reliability is not over fifteen years old, so we have few tests on papers made before that time with which to compare our present papers. As a whole, we are making much stronger papers today. In reference to durability comparisons, she had the following to say:

Durability Comparisons—"For durability comparison, we must depend upon artificial aging tests that can only be relative and in most cases misleading and erroneous, as artificial aging tests may intensify one factor disproportionately. Of the various methods for testing paper for durability, the folding tester seems to show differences in the paper in a greater degree than the other physical testers. Folding tests are only reliable when run on standard machines under rigid humidity control. It is hardly necessary to elaborate on the standardization of the folding machine, the calibration of the many parts and the continual inspection of these machines in order to obtain reliable tests. Folding machines in good condition will check themselves within 10 per cent and if an average of five folds is taken, the final results are sufficiently accurate for comparison. Loss in folding strength may be taken as an indication of loss in durability, due either to dehydration, oxidation or other chemical action. The other physical tests do not show the marked lowering in strength that the folding test does, owing to the fact that variables do not enter into the manufacture of the paper to obtain a good bursting strength, tear or tensile as they do in getting a good fold test. Generally, any paper giving a good fold will give good tests on the other instruments.

"Present work on permanent and durable paper, therefore, takes into consideration both the chemical and physical testing and does not consider any paper, whatever its fiber content, as satisfactory unless it complies with the tests outlined above. Work on permanency is not new and its value has always been known. In 1891, the first agitation for an all-rag edition of a newspaper was started and almost every year since that time contributions have been made to the specifications necessary to insure permanency. If certain tests and definite specifications may be arrived at generally it will be comparatively simple for the paper manufacturer to make paper to comply with their tests and thereby insure the consumer that the paper he purchases will be both permanent and durable."

Discussion on Permanence and Durability of Paper

Emil Heuser said it was a good thing to distinguish between durability and permanence of papers. Permanency was really a higher degree of durability.

W. G. MacNaughton said that newsprint was popularly supposed to be the least durable and least permanent of any paper, but the weakness in this paper was due to chemical reactions set up in the paper and not to the substance itself. He was reasonably convinced that alum was to blame for the impermanent character of most papers, coupled with the fact that raw wood had a marked tendency to chemical acidity.

G. F. Kennedy, of the Hercules Powder Company, disputed the contention that rosin was to blame for the deterioration of paper and it was more likely to be alum that was at fault, alum being used for salting out rosin in the sizing process.

M. D. Bardeen was on the program for a bibliography of the literature on paper permanence, but as he was not present his contribution was taken as read by title.

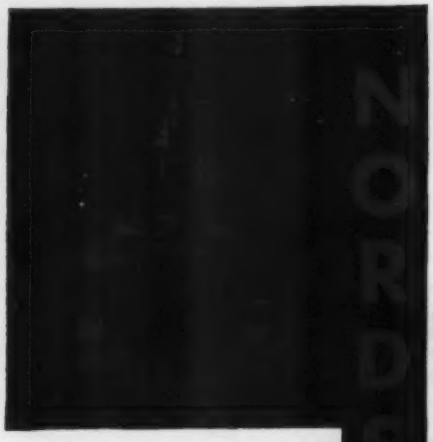
Behavior of Different Fibers

Edwin Sutermeister was then invited to present his paper on "Fiber Differences." He said that his paper had been prepared with the object of giving the non-technical man some idea of the nature of cellulose fibers. In reply to a question by Professor Hibbert concerning the changes that are likely to occur in cotton, linen and wood-pulp fibers from abrasion and, speaking in a general way, hydration, Mr. Sutermeister said that linen fibers had a tendency to split into fibrillae more readily than cotton and that there was little of this kind of splitting with wood fibers.

Fibers Classed According to Paper Made from Them—Mr. Sutermeister said he was disposed to classify fibers according to the grades of paper made from them. Cotton and linen fibers were used in papers of the highest grade and in some rather indifferent types of paper depending upon the quality of the cotton or linen fibers employed. Bleached sulphite, sulphate and soda fibers were used in the manufacture of book paper, the unbleached pulps made by the sulphite and sulphate process being employed in the manufacture of bags and wrapping papers where strength was of more importance than color or durability. The straw fiber used in the manufacture of certain grades of boxboard was in a class by itself, as was also groundwood fiber.

New Cuttings Best—Fibers of cotton or linen from new cloth cuttings were superior to those made from old and badly worn rags, for he pointed out that either could be used on the mere specification of rag stock. Chemical wood fibers vary in quality according to how the wood is cooked and the pulp bleached, and papers made from them may develop differences according to the kinds and amounts of the impurities present in the pulp.

Cooking Does not Influence Length of Fiber—Mr. Sutermeister called attention to a common fallacy regarding the



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Second Award ($100.00)

Hydraulic Lubrication Insures Effective Manipulation

Submitted by G. E. Genung, *13326 Terry Ave., Detroit, Mich.*

Third Award ($50.00)

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Submitted by G. C. Bemis, Jr., *American Smelting & Refining Co., Santa Barbara, Chihuahua, Mexico*

Fourth to Eighth Awards ($10.00 Each)

Won't Leak, Won't Stick, Lubrication Does the Trick

Submitted by T. S. Barlow, *501 East 21st St., New York City*

The Valve Controls the Flow, the Screw Controls the Valve

Submitted by Henry A. Webber, *2331 Donald St., Ames, Iowa*

The Turn of a Screw Pushes Lubricant Through

Submitted by Hal D. Draper, *Asso. Prof. of Chem., State Teachers' College, Fresno, Calif.*

Nordstrom's Perfection Is Your Protection

Submitted by Russell Egbert, *Box 433, Marcus Hook, Pa.*

Eighth to Twentieth Awards ($5.00 Each)

For Those Whose Goal Has Been Control
Submitted by Arthur Atkins, *1055 Green St., San Francisco, Calif.*

Nordstrom's Lubricated Action Is the "Seal" of Satisfaction
Submitted by S. St. Claire, *308 Oakland Ave., Oakland, Calif.*

Bringing Pressure to Bear on Valve Troubles
Submitted by Albert S. Eggleton, *781 Ocean Ave., Brooklyn, N. Y.*

Will Stand the Strain on Any Main
Submitted by Fred J. Maples, *Box 368, Morris, Okla., c/o O. N. G. Corp.*

Simple to Lubricate, Easy to Operate
Submitted by G. W. Martindale, *2254 Whitney Ave., Niagara Falls, N. Y.*

They Lubricate As They Operate
Submitted by Edith M. Bell, *1229 Boardwalk, Atlantic City, N. J.*

Loosened and Tightened by Lubricant
Submitted by L. D. Nicolson, *1345—30th St., N. W., Washington, D. C.*

Where Nordstroms Go In Troubles Go Out
Submitted by E. J. Shaunce, *146 No. 79th St., Highland Park (Upper Darby), Pa.*

With Every Connection Comes Your Protection
Submitted by C. G. Schram, *1322 S. Wabash Avenue, Chicago, Ill.*

Once Installed Never Stalled
Submitted by Charles W. Smith, *3736—26th Ave. West, Vancouver, B. C.*

Made Their Way By the Way They're Made
Submitted by E. D. Murphey, *Box 487, West Tulsa Station, Tulsa, Okla.*

Satisfaction at Every Turn
Submitted by Clair Wilkes, *Scio, Ore.*

★ **11,670**

Slogans entered in the contest recently conducted by the Merco Nordstrom Valve Company were carefully analyzed by the Jury of Awards. We take this opportunity to thank the many contestants for their contributions.

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length of fibers. Thus sulphite is longer than soda fiber, but the size of the fiber is not influenced by any difference in the two cooking processes. It happens so because soda fiber is usually made from poplar and other broadleaved trees which are short fibered, and sulphite is made from woods with a much longer fiber. All the coniferous woods, like spruce, fir and pine give long-fibered pulps, while the broadleaved wood such as poplar, maple, birch, gumwood, etc., make short-fibered pulps.

Action of Beating on Fibers—Some of the characteristics of particular fibers were described by Mr. Sutermeister. Thus, he said that linen fibers when beaten split lengthwise and form fibrillae which are particularly suitable for making thin but strong tissues. Sulphite does not do this; because of its length and ability to "hydrate" or become slimy when beaten, it imparts strength to papers. Soda fiber is a good filler and gives an improved printing surface. Groundwood consists of fiber bundles and fragments of fibers which are unaffected by the beating process, neither splitting nor hydrating, and hence the grades of paper in which groundwood can be used are limited, being confined to such grades as news, boards, etc.

Chemical Properties of Fibers—In regard to the chemical properties possessed by the different fibers, Mr. Sutermeister said these could not be discussed to any extent without getting into deep water. The present understanding is that the cellulose molecule is the same in all fibers, any chemical differences being related to impurities. Not enough is known about these impurities to talk much about them.

Poor Rag No Better than Wood Pulp—The question of durability of paper received attention. In Mr. Sutermeister's opinion, a paper made from poor grade rag stock is no better than one made from high-grade chemical pulps, and it was asserted that "If the cellulose molecule is the same in all fibers, it would seem that the removal of impurities from chemical pulps until they reach the same degree of purity as rag stock should make them as durable as high grade cotton or linen fibers. It is believed that this is being accomplished in some of the purified wood pulps now on the market, but unfortunately proof of the point cannot be made for another century or so."

It was stated that only comparative methods are available for testing fibers for durability, a most unsatisfactory state of affairs.

Old Rags Defended

Jessie E. Minor opened the discussion of Mr. Sutermeister's paper by commenting on what she termed his sweeping statement concerning papers from old rags being less permanent than good sulphite paper and she defended rag pulp against chemical pulp.

Discussion of Permanency Tests

Some discussion ensued regarding artificial methods of determining paper permanency. E. J. Kennedy said that the Detroit Edison Company had done a great deal of work in determining the effect of silent electric discharges on paper permanency, and Dr. Heuser suggested artificial aging by exposure to ultra-violet rays, which brought George A. Richter to his feet, he making the point that light plays a small part in the practical consideration of paper permanency. Paper was seldom exposed to ultra-violet rays and attention should be paid to other agents.

A series of contributions to the chemical tests for permanence and their interpretation was made by several members. Theobold C_3 Bentzen gave details of the mercerization test which was not really a test for permanence but only a determination test for alphacellulose. The different steps in carrying out the test were detailed minutely by him.

Physical Standards for Pulp

The Committee on Physical Standards for Pulp held a well attended meeting on Wednesday afternoon at which Donald E. Cable, chairman presented a set of tentative standard pulp testing methods, the following being an outline of their general features:

I—Method of sampling pulp.

II—Apparatus and method used in making and conditioning the sheets.

III—Preparation of sheets from disintegrated but unprocessed fiber (for unbeated, felting or initial test).

IV—Preparation of sheets from both pebble mill hydrated and disintegrated fiber after two or more time intervals.

V—Preparation of sheets from small beater processed fiber with stock for the sheets being removed progressively from the beater at regular time intervals.

VI—Provision is to be made for the testing of the above pulp sheets according to one or more of the following types of physical measurement:

(a) Bursting strength
(b) Tensile breaking strength
(c) Tearing strength
(d) Folding endurance

VII—Results shall be reported in "Per cent points" or numerically—one hundred times the ratio of average strength units observed divided by the average basis weight (25x40, 500 of the air dried (at 65 per cent rel. hum. and 70 deg. Fahr.) test sheets.

Bursting strength, tearing strength, folding endurance and tensile strength shall be reported in this manner. Per cent stretch shall be reported as in the official method for determining stretch of paper.

Makeup of Standard Test Sheets—The committee announced that a decision had been reached concerning details of the makeup of standard test sheets. The sheet area may be of any size within the limit of 36 sq. in. and 81 sq. in. Sheets made in the "unbeated" or initial strength test should have a standard basis weight of approximately 120 lb. (air dry ream 25x40—500). In the making of the pebble mill and beater test where the development of maximum bursting strength is attempted, the standard basis weight of test sheets should be within the range of 50 to 60 lb. (air dry ream 25x40—500).

An English Book on Pulp Evaluation—Doctor Cable called attention to the publication by the Technical Section of the Paper Makers' Association of Great Britain and Ireland of an "Interim Report of the Pulp Evaluation Committee," and said that this committee, of which Arthur Baker was chairman, was to be complimented on the thorough manner in which every aspect of the initial strength of pulp testing procedure had been investigated. The treatise represented a well written and illustrated method of pulp testing, which was supplemented, Dr. Cable said, by detailed accounts of carefully planned and conducted research studies.

Preparation of Fiber Test Sheets

An exhaustive paper on the preparation of fiber test sheets was presented by Merle B. Shaw, George W. Bicking and Leo W. Snyder in collaboration. Preprints of the paper were available and the apparatus employed were shown by photographic reproductions. The work described by the authors referred to the development of a laboratory method for making small sheets of fibers in studying the papermaking quality of pulp. Details were given of the forming of the sheet of fibers on the screen and the subsequent operations of couching, pressing, and drying. It was represented that with the equipment and procedure described, sheets uniform in quality could be made by an operator of average skill, the personal equation being so reduced that comparable results could be obtained by different operators.

Beater Test Method for Official Standard

A detailed set of specifications for both equipment and the manner of processing pulp by means of a small beater, with controlled bedplate, was submitted for adoption by the committee, consisting of H. A. Rothchild, Ivar Lundbeck and D. E. Cable. These will form Section V of the proposed official standard method for the evaluation of pulp. A sectional view of the beater both in elevation and plan illustrated the report, and details of the process of beating were given.

Papers presented, in addition to those mentioned, included one on "Pulp Evaluation" by O. P. Gephart, chief chemist of the Oxford-Miami Paper Company, and "A Flow

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Rate Method of Pulp Evaluation" by E. R. Schafer and L. A. Carpenter, of the U. S. Forest Products Laboratory, Madison, Wis.

Corrosion Problems

The Committee on Corrosion met in the banquet hall on Wednesday afternoon when J. D. Miller presented his report as chairman. The work of the past year had been confined to a large extent, he said, on the process equipment of the sulphite industry. An attempt had been made to estimate the value of the corrosion loss in sulphite mills in dollars per year per ton daily production. The range of the replies to a questionnaire was wide, but the average was $98.75. Thus a mill rated at 50 tons a day would have a replacement bill $4,937.50 annually, to which figure labor charge and loss in production will have to be added.

It was stated that results with ferrous alloys had been irregular. The alloys appear to be influenced by thermal treatment following fabrication. A point deemed worthy of special consideration was electrolytic action which had caused failures in some instances. The best alloys for resistance to sulphite corrosion were stated to be those of the ferrous alloy type of 18-8 chromium-nickel, with or without molybdenum. It was stated that progress in the technology of these alloys might result in permanent sulphite equipment. The initial cost would be high, but warranted by attendant advantages. Manufacturers of corrosion-resistant materials have been invited to co-operate with the committee in investigating their products as applied to sulphite conditions.

Study of the Chrome-Nickel Alloys

Walter M. Mitchell, of the Central Alloy Steel Corporation, Massillon, Ohio, gave in a paper a general review of corrosion-resistant alloys for pulp and paper mills. The character of resistance to attack from corrosion by acids, sulphur compounds and oxygen was said by him to depend largely on the inherent chemical affinity of the metal, or, as he expressed it, "the reciprocal of the affinity, the inertness to certain other elements, the most important of which are oxygen, sulphur, and the halogens, and upon the degree to which this inertness may be increased by admixture of other alloy in metals. Thus in a metal inherently resistant to acids, resistance will be increased by the addition of silicon; and similarly increased resistance to oxidation will be obtained by additions of chromium."

Alloys of Lead and Bronze—Mr. Mitchell pointed out that lead was resistant to sulphur dioxide and that additions of this element to bronzes notably increased their resistance. Compositions of lead and bronze varied, he said, from a familiar 85:10:5 to high lead bronzes with 70 per cent copper, 5½ per cent tin, 5½ per cent antimony and 19 per cent lead. Another composition in considerable repute contained 90 per cent copper, 9½ per cent tin, and ½ per cent lead. Both antimony and lead were desirable additions and increased resistance to sulphurous acid, though the addition of a high percentage of lead was accompanied by increased casting difficulties.

Chrome-Nickel Superior to Bronze—Discussing the chromium alloys, Mr. Mitchell said that these were attracting much attention, the most interesting of them being the chrome-nickel and chrome-nickel molybdenum alloys produced under Krupp-Nirosta patents and generally classed with the stainless irons and steels. He said it appeared unquestionable that the chrome-nickel alloy is the better metal as compared with bronze. The 18-8 composition was generally satisfactory for cold sulphur dioxide and sulphurous acid, but if resistance at elevated temperatures was desired, molybdenum must be added. It appeared to Mr. Mitchell that the chrome-nickel-molybdenum combination 18-8-3, such as Krupp's V-4-A or its American equivalent, Enduro KA4 was quite satisfactory from the corrosion resisting standpoint. It is a workable metal and has been produced in virtually all forms, as castings, sheets, plates, bars, seamless drawn tubing, etc.

An Alloy Sulphite Digester Proposed—Mr. Mitchell's paper represented a most important contribution to the subject of corrosion resisting alloys. He said that the fabrication of a full-size sulphite digester of chrome-nickel-molybdenum alloy was not an impossibility, but in its construction riveting would be preferable to welding. The advantages of an alloy digester would be reduction in corrosion troubles and elimination of the brick lining.

Tests of Ferro Alloys

Andreas Christensen, sulphite superintendent of the Rhinelander Paper Company, Rhinelander, Wis., gave a practical paper on the application of certain ferro alloys which had been developed in the Research Department of the Krupp Iron Works, in Germany, the base patents of which were the property of the Chemical Foundation of America. Two of the alloys had been tested by him over a period of two years and the particulars given in his paper were based on results obtained in the mill rather than in laboratory experiments. Alloy No. 1, belonging to the high-chrome iron group would analyze somewhat as follows: chromium 25-30 per cent, manganese 1 per cent, nickel 0.5 per cent, silicon 0.5 per cent, carbon 0.25 per cent. Alloy No. 2 belonged to the 18-8 group, having a composition like the following: chromium 17-20 per cent, nickel 7-10 per cent, manganese 0.5 per cent, silicon 0.5 per cent, carbon 0.15 per cent.

Application of Alloys—The alloys had been used in relief, gauge and test line piping; disks, seats, and stems in valves handling hot cooking acid and relief gas; digester plugs and strainers; digester cover liners; plug cocks for test and gauge line; blowpit drainer bottoms, and in other parts of the system exposed to corrosion.

The machining of ferro alloys presented a problem and this together with the higher cost of the metal made them more expensive than bronze, but the maintenance cost per ton of pulp might offset the high initial cost, as Mr. Christensen said that some fittings had been exposed continuously to hot calcium bisulphate liquor for upwards of two years without showing any signs of corrosion.

Digester Explosions

The paper by William D. Halsey, during the sitting of the Corrosion Committee, dealt with the accidents from explosions of digesters caused by corrosion. Mention was made also of the potential dangers of disastrous explosions from the rupturing of paper machine dryers. Mr. Halsey is connected with the Steam Boiler Inspection and Insurance Company, Hartford, Conn., and was able to draw on his experience in describing certain disastrous accidents in connection with digesters and other pressure vessels used in the pulp and paper industry.

THIRD DAY'S SESSION OF T.A.P.P.I.

During the forenoon of Thursday, meetings of the committees on Pulpwood and Alkaline Pulping Processes, Sulphite Pulp, and Stuff Preparation took place in different parts of the hotel.

E. S. Hinman, chairman of the Pulpwood and Alkaline Pulping Processes Committee, reviewed the work of the committee in a preliminary paper, reference to which has been already made.

Pulp Washing on Vacuum Filters

H. A. Morrison, of Oliver United Filters, Inc., described in a paper of considerable interest the use of vacuum filters for recovery of black liquor from soda and kraft fibers and for removal of residual bleach from all types of bleached pulp. He said that many vacuum filter washer machines are now operating on alkaline pulps, the majority of new mills having no other type of washer for recovery of black liquor. Kraft pulp is difficult to wash because it is blown from the digesters at high density. The liquors contained notable amounts of sodium resinate and other dissolved substances, compounds which caused foaming during vacuum washing, the pulp being commonly made from highly resinous woods, which is not the case with soda pulp. He presented tabular estimates of recovery of fibers and chemicals in pulp washing for black liquor and bleach. Vacuum filter bleach washers lose less than 0.3 per cent of the pulp handled which

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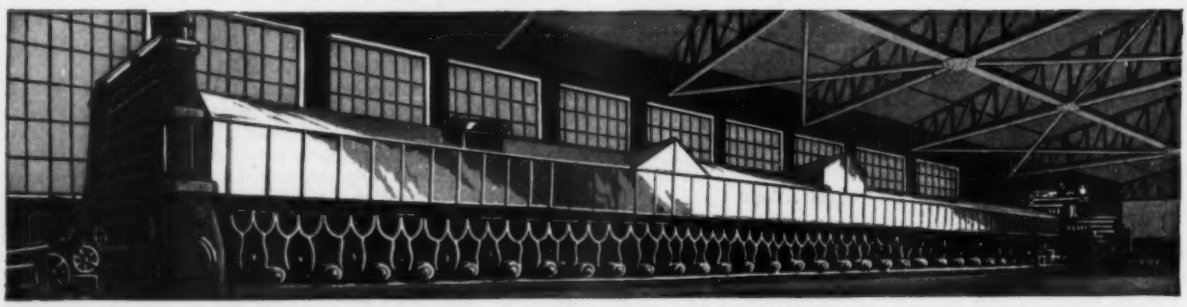

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compares most favorably with the results from other types of washers. The total investment in equipment for bleach washing amounted to about $10 per ton of daily production. Vacuum filters are now used to some extent as bleach washer save-alls on deinked old bookstock. Although the white water from the book paper machines carries more than 10 lbs. of clay filler per 1,000 gallons of filtrate, the waste from the washer was said to average only half a pound of total suspended solids per 1,000 gallons.

Study of Wood Deterioration

A valuable study of wood deterioration was contained in a paper by Francis J. Cirves, research chemist, Mosinee Paper Mills Company, Mosinee, Wis. A table of the chemical constituents of wood arranged in order according to formation and molecular complexity accompanied the paper.

In a summary of results bearing on the behavior of deteriorated woods it was shown that these are high in acids and accordingly consume much alkali when digested for pulping. This reduces the amount of alkali in the cook and leads to rough or uncooked pulp with pronounced blowing difficulties. The soapy nature of the pulp and liquor is much reduced in the case of aged woods owing to their low fat, wax and rosin content.

Papers at the Sulphite Meeting

At the meeting of the Committee on Sulphite Pulp on Thursday forenoon, several papers were to be presented by members of the staff of the U. S. Forest Products Laboratory. The papers included the following titles "Further Studies in the Semi-Sulphite Process," by C. E. Curran, W. H. Monsson and G. H. Chidester; "Chemistry of Neutral Sulphite Pulping Process II," by M. W. Bray; "Effect of Bleaching Variables on the Strength Properties of Easy Bleaching Spruce Sulphite," by P. K. Baird and R. H. Doughty; "Sulphur Burning in Sulphite Acid Manufacture," by C. M. Cooper. Only two of the papers were available in preprint form, the last two listed here.

Maximillan A. Krimmel
President, Technical Ass'n, Pulp and Paper Industry

Effect on Bleaching on Pulp

Baird and Doughty showed that bleaching had most influence in lowering the strength properties of pulps, temperature, consistence and agitation being important factors in increasing the bursting and folding strengths. The effects were ascribed to a combination of chemical and mechanical actions acting favorably or unfavorably upon the strength producing properties of the pulp.

Control of Sulphur Burning

In the paper by Mr. Cooper, suggestions were made for improvement in the control of sulphur burners so as to avoid an excessive use of oxygen. A sulphite mill in burning ten tons of sulphur throws away heat equivalent to more than two tons of coal, and the development of cooling equipment to utilize the heat now wasted was suggested.

Stuff Preparation

Some interesting papers were presented by the Committee on Stuff Preparation, George K. Spence, chairman, and all of them were available as preprints, except one on the use of artificial grindstones by Joseph H. Slater, manager of the Escanaba Paper Company.

Operation of Centrifuge Separators

A paper by S. C. Lindberg on "Centrifugal Separation in Stuff Preparation" described and illustrated the Erkensator, Bird Centrifiner and Tolhurst Clarifier, machines that work on identical principles. Centrifugal separators are used for the removal of dirt, lumps, snags and shives for which sand traps, rifflers, magnetic separators and screens are generally employed, with this difference that the centrifugal separator is vastly more efficient than the older types of equipment mentioned, because it operates by means of centrifugal force rather than by gravity. In passing through the centrifugal separator, the paper stock is not only separated from the foreign material but is also subject to a "brushing out" action in passing over baffles in the apparatus, which are designed to trap the heavy dirt and remove light dirt floating on the surface. The Erkensator got its name from J. W. Erkens, of Duerin, Germany, who began the production of centrifugal separators ten years ago. In the United States the Bird Machine Company, South Walpole, Mass., and the Tolhurst Machine Works, Inc., Troy, N. Y., are producing the Bird Centrifiner and the Tolhurst Paper and Pulp Centrifugal, which work on the same principles as the Erkensator. The various centrifugal separators have a capacity ranging from 5,000 to 7,000 U. S. gallons an hour. The operation of the centrifugals is fairly well understood by now, as papers describing them have been read at superintendents' meetings all over the country. Mr. Lindberg demonstrated the operation of the separators by means of lantern slides.

Beating Straw without Washing

L. M. Booth, president of the Booth Chemical Company, Elizabeth, N. J., described a new process for producing straw paper from whole straw in which the customary washing procedure is eliminated and consequent stream pollution prevented. Instead of washing the hot straw it is delivered to the beaters from the rotary cookers, where digestion continues at beater dilution with less expenditure of time and power than with the old process. Instead of washing, the alkali used in cooking is neutralized by the addition of a combination of ferric sulphate and ferric chloride described as chlorinated copperas. One part of chlorine combines with 7.85 parts of ferrous sulphate, but in actual practice an excess of chlorine is used.

Method of Matching Colors

C. C. Schneider, chief chemist of the Hawthorne Paper Company, Kalamazoo, Mich., gave a description of his method of matching pulp colors. The system appeared to be complicated, but tables of quantities for use in laboratory experiments and in the beater room were said to simplify matters.

Analysis of Waste Waters

For the Subcommittee on White Water, A. W. Pesch gave details of a "Proposed Standard Method of Analyzing White and Waste Waters." Analytical methods were proposed for (1) total suspended solids (largely fiber and filler); (2) fixed suspended solids (largely filler residue); (3) volatile suspended solids (largely fiber); (4) total dissolved solids; (5) fixed dissolved solids; (6) volatile dissolved solids (organic and inorganic matter volatile on ignition).

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LUNCHEON AND CLOSING MEETING OF T.A.P.P.I.

The final general session of the Technical Association followed luncheon on Thursday, shortly after 1 o'clock. In opening the meeting, President Glatfelter announced the presence of a number of distinguished guests, including Harold Crabtree and Edward Beck, president and secretary, respectively, of the Canadian Pulp and Paper Association. He also named Jacob Dahl, a visitor from Norway, and Prof. H. K. Benson, of the University of Washington.

Amendments to Constitution

Several proposed amendments to the constitution and by-laws of the association, providing for the development of territorial divisions or sectional organizations, were presented by the secretary and these will be voted upon at the next meeting.

Durability and Permanence of Paper

Fred C. Clark was asked to present a report on durability and permanence of paper. This traversed much of the report presented at the meeting of the Cellulose and Fine and Special Papers committees on the previous day. Mr. Clark explained that no opportunity had been afforded for either a minority or majority report. He said that the durability of a paper had reference to its resistance to wear in handling, and permanency the degree to which a paper may resist chemical reaction or substances in the air. In book paper, durability was sacrificed to appearance and all papers were affected by mechanical handling and chemical changes due to light. The report was not conclusive and ended with the statement that a "satisfactory method for determining the life of a paper may be expected in the near future."

New Officers Nominated and Elected

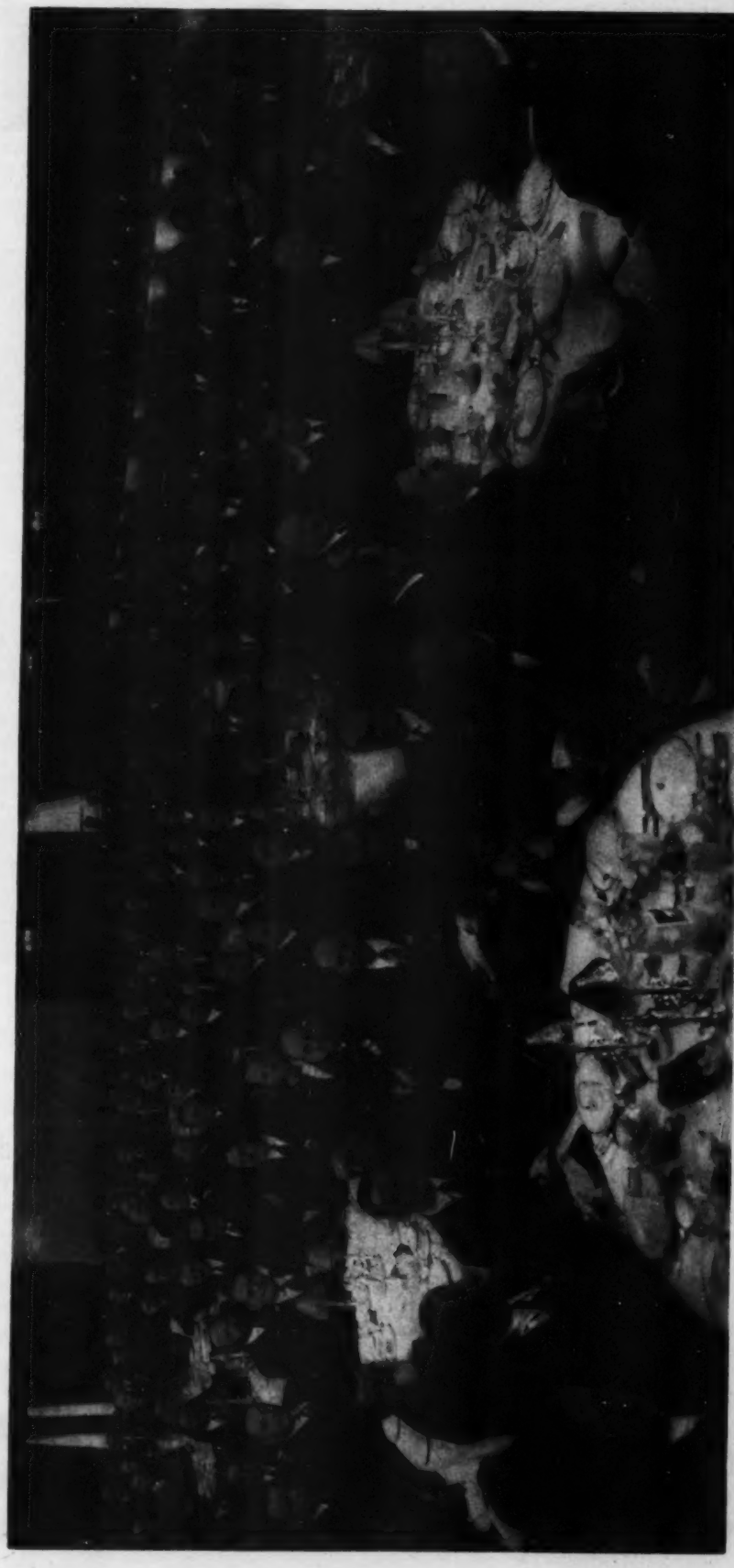
Mr. Clark was again called for, to present a report as chairman of the Nominating Committee. He said the committee had agreed on the following nominations:

For president, Maximillan A. Krimmel, of the Hammermill Paper Company, Erie, Pa.

For vice president, R. H. Laftman, of the Bogalusa Paper Company, Bogalusa, La.

For secretary-treasurer, Ronald G. Macdonald, 18 East 41st Street, New York.

For members of the Executive Committee for three years, Joseph H. Slater, manager and director of Escanaba Paper Company, Escanaba Paper Company, Escanaba, Mich.; W. O. Johnson, mill manager, Strathmore Paper Company, Woronoc, Mass.; for two years to fill out the unexpired term of R. H. Laftman, C. C. Herit-



Picture taken at luncheon of the Technical Association of the Pulp and Paper Industry, February 20, 1930, at the Pennsylvania Hotel, New York City

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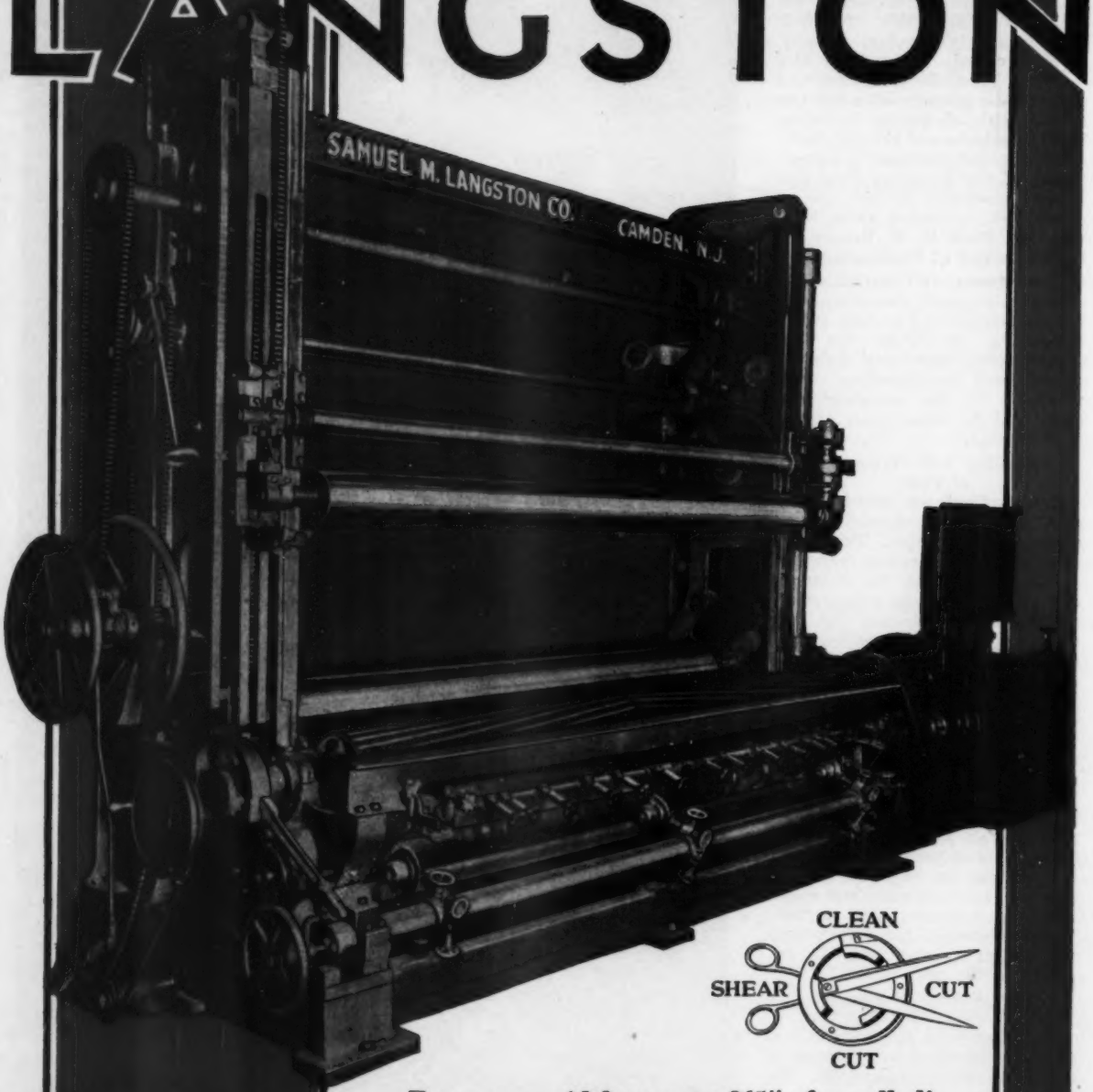

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SLITTERS

age, manager of research, Oxford Paper Company, Rumford Falls, Me.

On motion of R. H. Stevens, the secretary was instructed to cast one affirmative ballot for the election of the officers named, and this was done.

Mr. Krimmel's Speech

Following his election, Mr. Krimmel, the new president addressed the gathering. He said he was much more impressed with the responsibility of the office than with the honor attached to it, and he asked all present to help him carry the burden of responsibility by keeping in close touch with him. He said that the association had a distinct service to render to corporate members while the individual member would get service in proportion to the service which he rendered to the association.

The Institute of Paper Chemistry

Retiring President Glatfelter, who acted as master of ceremonies, then called upon Dr. Otto Kress to tell the gathering something about the newly founded Institute Paper Chemistry in the city of Appleton, Wis., and Doctor Kress, who is one of the original members of the Technical Association, outlined the aim and scope of the Institute, which he said was founded through the efforts and vision of a group of Wisconsin paper manufacturers. The Institute has been affiliated with Lawrence College, a degree-conferring institution that is nearly 100 years old. He said that the Institute would reap benefits from this affiliation. The Institute was officered by well-known paper men, having for president Ernst Mahler, vice president of the Kimberly-Clark Corporation, in charge of the Department of Manufacturing, and with D. C. Everest, secretary and general manager of the Marathon Paper Mills Company, Rothschild, Wis., vice president. The trustees consist of L. M. Alexander, president and treasurer of the Nekoosa-Edwards Company, Inc., Port Edwards, Wis.; D. K. Brown, treasurer and general manager of the Neenah Paper Company, Neenah, Wis.; M. A. Wertheimer, president of the Thilmany Pulp & Paper Company, Appleton, Wis., and Hugh Strange, secretary and treasurer of John Strange Paper Company, Menasha, Wis.

Starts with a Postgraduate Course—Doctor Kress said that the plan of the Institute was to start with a postgraduate course for men holding a Bachelor of Science degree and after that give a regular four years collegiate course. The Institute of Paper Chemistry has made a start with six students who are all enthusiastic and earnest in their work. One of the great functions of the Institute would be the formation of a library of books on papermaking.

After Prof. H. K. Benson had given a talk on "The Measurement of Sulphite Pollution in Sea Water," and Roderick Olzendam, of the Metropolitan Life Insurance Company had discussed Human Engineering the meeting was adjourned.

Chemical Microscopy in Paper Mill Laboratory[1]

By KENNETH P. GEOHEGAN
Chemist, Aetna Paper Company, Dayton, Ohio

MANY who are not acquainted with the methods of chemical microscopy seem to think that they require a large amount of time, and they picture a chemist that uses them as spending most of his days looking through the microscope. The truth is just the opposite. The methods of chemical microscopy are so rapid that a few minutes at the microscope often takes the place of an hour with test tubes and beakers. A chemist that uses these methods has more time to devote to other problems; he is able to make analyses for which he would be too busy otherwise.

There is no reason to distrust the methods of chemical microscopy. Many of the reactions used in microscopic analysis are the same as those in the more familiar way of making qualitative analyses. Those that differ from the traditional methods have been chosen because they are more convenient, give quicker results, or furnish information that can not be obtained otherwise.

The methods of chemical microscopy are not so intricate as they may appear. One need not be an expert microscopist to take advantage of them, although experience and facility in the use of the microscope make them more valuable. Courses in chemical microscopy furnish the best and quickest way of acquiring proficiency in this field, but excellent books make the use of microscopic analysis possible to those who are unable to take a course in this subject.

Chemical Microscopy Literature

It is a satisfaction to be able to obtain books on chemical microscopy that are as carefully written as those by Dr. E. M. Chamot, Professor of Chemical Microscopy and Sanitary Chemistry at Cornell University. They give a thorough description of the principles of the microscope and of its applications to chemical investigations, including an explanation of its use in examining the optical properties of crystals and systematic directions for applying the qualitative tests. Even the second education of 'Elementary Chemical Microscopy" has been exhausted. A new 'Handbook of Chemical Microscopy", in two volumes, has been written by Dr. Chamot and Dr. C. W. Mason. Volume 1, which has just been published, includes the 'Principles and Use of Microscopes and Accessories, and Physical Methods for the Study of Chemical Problems." Volume II, which is in preparation, will give "Chemical Methods and Inorganic Qualitative Analysis." This book contains much material not included in "Elementary Chemical Microscopy" and is by far the best book on the subject. Every chemist should have it in his library. Books by Dr. H. Behrens give tests for some of the rarer elements" and for organic compounds", but they are not so comprehensive nor so well suited for those who wish to study this subject.

The field of chemical microscopy is not limited to the observation of crystal forms; in fact, the variey of ways in which the microscope can be used for chemical investigations is amazing. It can be used for the determination of refractive indices, melting-points, subliming-points, the rotation of polarized light, the proportions of the constituents of powders, for qualitative analysis, for metallography, for the estimation of molecular weights, for the measurement of particle size, and for measurements of length, thickness, area, and volume.

Methods of Chemical Microscopy

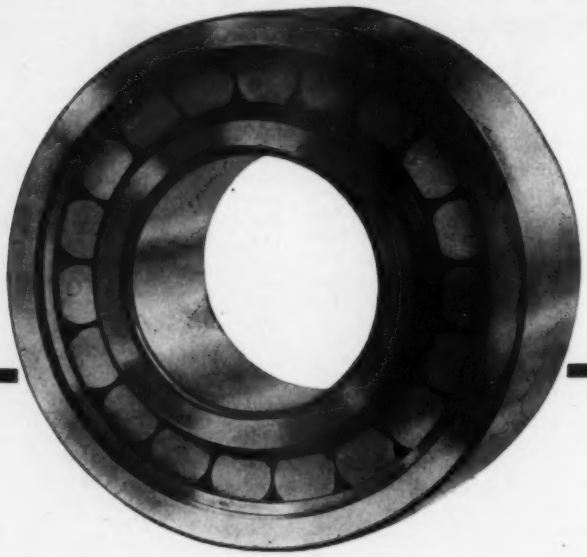
The purpose of this paper is not to describe in detail the methods of chemical microscopy, but to give a general idea of the methods of microscopic qualitative analysis, and to illustrate these methods by describing their application to the identification of paper fillers.

The methods generally used in qualitative analytical microscopy depend on characteristic chemical reactions. They identify the elements in a manner that is similar to the usual qualitative analysis, but the reaction products are recognized by their form as well as by their color. The reactions are carried out in small drops on microscope slides, and the reaction products are examined under the microscope.

Often, it is possible to test for two or more elements with one reagent and to identify them simultaneously. Thus one of the most useful reagents, potassium mercuric thiocyanate, gives characteristic tests for zinc, copper, cadium, cobalt, and iron, with the possibility of showing the presence of a number of other elements. Cesium chloride is used to test for antimony, tin, and bismuth. The saving of time is obvious. Further time is saved by using small amounts of materials. This allows evaporations, fusions, and even filtrations to be carried out in a fraction of the time required by the usual labratory methods.

The chemist does not need to follow a rule of thumb procedure, but can select his tests according to his judgment, based on the kind of substance being examined. Each test that he makes gives him a basis on which to select the following test. If the substance is a solid, microscopic examination, perhaps in polarized light, allows him to judge whether it consists of one or of several materials. If it consists of more than one, he can select particles of each and test them sep-

[1]Presented at annual meeting of T.A.P.P.I., Pennsylvania Hotel, New York, N. Y., Feb. 18, 1930.



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arately. Thus he can identify not only the elements, but the way in which they are combined.

The information obtained by qualitative reactions can be supplemented by an examination of the optical properties, which will furnish information that can not be obtained by the usual qualitative analysis. A good example, given by Dr. Chamot, is the differentiation between the three phosphates of sodium by means of their optical properties. It is possible to distinguish even between their various hydrates.

The methods used in examining the optical properties of crystals are similar to those used in petrography. The crystal system is determined from the crystal form, by reactions toward polarized light, and in some cases with the help of interference figures. The degree of double refraction is noted, either approximately or by measure, and the refractive index is determined by mounting the substance in liquids of known index of refraction. The results can be compared with tables[3,4,5,6] or with the properties of a sample of the substance that is suspected to be present. It is usually unnecessary to make all of these determinations, as one of them may suffice to distinguish between two compounds.

In other words, the elements can be identified by qualitative tests that are more rapid than those usually employed, and additional information can be gained by an examination of the optical properties. This procedure may appear complicated when stated indefinitely in a few words, as above, but carefully explained, as by Dr. Chamot, the procedure is remarkably simple and requires little time.

Paper Mill Labratory Microscopes

The ordinary paper mill microscope can be used to recognize most of the reaction products of the qualitative tests, and also for the determination of the refractive indices of isometric crystals. The accurate determination of the refractive indices of doubly refracting crystals requires the use of polarized light; but most microscopes can be equipped with a polarizer and an analyzer at a small cost. This added equipment will be useful to the paper mill chemist in many ways; among others, in the examination of fiber structure[2].

A special microscope is required for examining more thoroughly the optical properties of crystals. Both the Spencer Lens Company and the Bausch and Lomb Optical Company make microscopes designed by Dr. Chamot. These are especially adapted for use in chemical investigations and are a great improvement over those formerly supplied for this purpose.

The uses of the microscope in a paper mill labratory are so numerous that it would be impossible to describe them. The examination of boiler-water, boiler-scale, boiler-sludge, the deposit that forms on the machine wires, pitch, dirt-specks, slime, mold, and the effect of the surface of paper on printing, are only a few of the ways in which the microscope is useful. The identification of paper fillers has been chosen for discussion but it is hoped that emphasizing this application will not give the impression that the microscope is better suited to this purpose than to solving the many other paper mill problems.

The identification of paper fillers furnishes an excellent illustration of the advantages of microscopic analysis; it is a problem with which all paper mill chemists are familiar. It requires both optical tests and examination of the optical properties and it shows the remarkable saving of time that is characteristic of all microscopic analyses. Through the kind permission of Dr. Chamot, reference is made to the results of work done by the writer, with Dr. Chamot's assistance, in the Labratory of Chemical Microscopy at Cornell University.

The method that is recommended by the Technical Association for the analysis of the mineral filler in paper[7] requires at least 0.2 grams of ash. This is extracted three times with dilute hydrochloric acid, and the extract is tested for aluminum, calcium, and sulphate. Effervescence when the acid is added shows the presence of carbonates. If there is an insoluble residue, it is dried and fused with sodium and potassium carbonates. The fused mass is disintegrated and extracted with hot water. The extract is tested for silica by evaporation with dilute hydrochloric acid and by treatment with dilute hydrochloric acid. It is then filtered and the filtrate is tested for sulphate. The portion that is insoluble in water is dissolved in dilute hydrochloric acid and tested for aluminum, barium, and magnesium.

The qualitative tests of microscopic analysis can be applied according to a similar procedure and will give the same results. This is more convenient than the foregoing method and also more rapid, but it is not recommended for the microscopic identification of paper fillers for reasons that will be given later. However, it may be of interest to describe a procedure of microscopic analysis of mineral fillers that follows the general plan of the standard method, in order to show the ways in which microscopic qualitative analysis resembles, and the ways in which it differs from the usual quantitative procedure.

Mineral Fillers

This procedure can be commenced by adding a small amount of the ash to a drop of dilute hydrochloric acid on a microscope slide, watching for the effervescince that would show the presence of carbonates. The slide is then heated over a microburner and allowed to cool. Calcium sulphate, if present, will separate as characteristic crystals. If no crystals of calcilm sulphate appear, a test for calcium is made by adding a little sodium sulphate to a portion of the drop. If no calcium is present, another portion of the drop is tested for sulphates by adding a little calcium acetate or by allowing to flow into the drop a solution of barium chloride. To test for aluminum, the remainder of the drop is neutralized with dilute ammonium hydroxide, acidified with a very little dilute sulphuric acid, and some solid cesium sulphate is added to form the characteristic crystals of cesium alum. If much calcium is present, it is best to decant the ammoniacal solution before dissolving the aluminum hydroxide with the sulphuric acid.

The fusion is performed in a small platinum cup or on a small piece of platinum foil; it requires only one or two minutes. A little water is added, warmed, and decanted from the insoluble portion. This extract is tested for silicates by placing a drop on a celluloid slide and adding ammonium fluoride, sodium chloride and sulphuric acid. Sodium silicofluoride separates as crystals that are easily recognized. Another portion of the extract is tested for sulphates by evaporating it to dryness with hydrochloric acid, adding a little hydrochloric acid, and allowing to flow into the resulting solution a drop of a solution of barium chloride.

Part of the water insoluble portion of the fused mass is heated with a drop of concentrated sulphuric acid on a microscope slide. Upon cooling, characteristic crystals of calcium sulphate or of barium sulphate will separate if either calcium or barium is present. If both are present, they can be recognized simultaneously, as the two sulphates form crystals of different shapes. The rest of the water-insoluble portion is dissolved in dilute hydrochloric acid and tested for aluminum as described above, and for magnesium by adding ammonium chloride, sodium phosphate, and ammonium hydroxide or sodium hydroxide. The crystals of ammonium magnesium phosphate are characteristic.

It has taken longer to describe the microscopic tests than to describe the usual qualitative analysis but the procedure when using the microscope requires less time. The fusion requires less time. The fusion requires only one or two minutes, filtrations are unnecessary, evaporations to dryness and resolution take only a fraction of a minute, and the ash from one gram of paper is more than enough. It is not necessary to burn three to ten times as much paper as that required to determine the percentage of ash.

It has been stated that the above microscopic method is not recommended for identifying paper fillers. Other microscopic methods are more rapid and give more information. Before considering one of these, let us examine critically the results obtained by both of the methods described above.

In both methods, tests are made for the following elements and radicals; carbonate, calcium, aluminum, sulphate, silicate, barium, and magnesium.

The interpretation of these results, as recommended by the Technical Association, can be summarized as follows:

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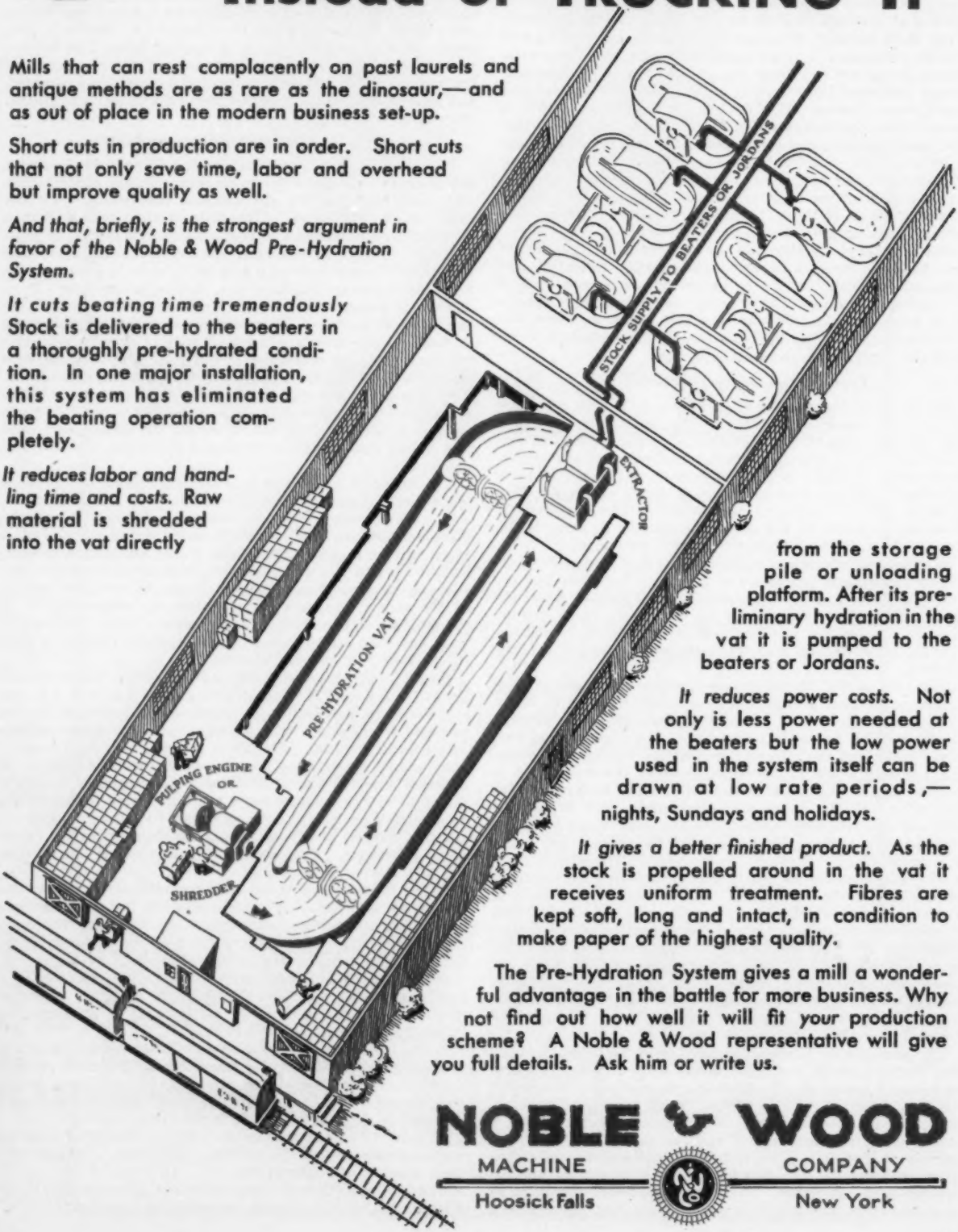

It reduces power costs. Not only is less power needed at the beaters but the low power used in the system itself can be drawn at low rate periods,—nights, Sundays and holidays.

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In the acid-soluble portion of the ash: calcium and sulphate indicate $CaSO_4.2H_2O$ (crown filler), calcium and alkaline ash indicate $CaCO_3$ (whiting or chalk), barium and carbonate indicate $BaCO_3$ (barium carbonate).

In the acid-insoluble portion of the ash. barium and sulphate indicate $BaSO_4$ (blanc fixe or barytes), aluminum and silicate indicate aluminum silicate as china clay, magnesium and silicate indicate magnesium silicate from talc or asbestine.

"A microscopical examination of the ash assists in determining the variety of silicious minerals present."

It was necessary for the Technical Association, when selecting a standard method, to choose procedures familiar to all paper mill chemists, and it was necessary to describe this method so that it could not be misunderstood. Microscopic qualitative analysis is not generally familiar and it is difficult to describe accurately the appearance of mineral fillers under the microscope. Let us hope that before long, microscopic qualitative analysis will become as well known as microscopic fiber analysis. Then it will be possible to include in the "Paper Testing Methods" a procedure for identifying paper-fillers that is more rapid and more comprehensive.

The methods that have been outlined do not permit distinction between the natural and the artificial minerals, such as barytes and blanc fixe, or calcite and precipitated chalk, nor between the different calcium sulphate fillers, of which there are four common types. Use of the microscope permits these distinctions and also removes the danger of confusing pyrophyllite talc with china clay. Both are silicates of aluminum.

These distinctions are important, for the characteristics of the natural fillers are different from the properties of the precipitated products. Pyrophyllite has the characteristics of talc and not of china-clay.

The following method is rapid and serves to identify all of the common fillers.

A little of the ash is placed in a small drop of water on a microscope slide, distributed thoroughly in the drop, and examined under the microscope. Polarized light is not essential, but it is a great help. This examination will identify talc, asbestine, agalite, china clay, silica, or diatomaceous earth, and it will distinguish between natural and precipitated fillers. It also will give a clue to the identity of fillers other than the silicates, and will show the presence of an unusual filler.

It is fortunate that the silicates, which are difficult to analyze, can be recognized easily by their appearance. The particles of talc are large and more or less fibrous, depending on the variety. The most fibrous talcs are asbestine and agalite. Between crossed nicols, most of the particles of talc show weak double refraction; the fibrous particles and particles of dolomite are strongly birefringent.

Most of the particles of china clay are small. Of the larger particles, the flaky, irregular grains of kaolinite are characteristic. The particles of English clays are more uniform in size than those of American clays, and a greater proportion are sufficiently large that their shape can be seen at a magnification of 100 diameters. The proportion of particles that show a marked double refraction is greater in English clays.

Grains of silica (quartz) have low indices of refraction, weak birefringence, and conchoidal fracture. The particles of diatomaceous earth are unmistakable.

The particles of natural fillers are irregular and not uniform in size, the particles of precipitated fillers are more regular, more uniform, and usually much finer. Particles of barium carbonate, magnesium carbonate, calcium carbonate, and anhydrous calciums sulphate show very strong birefringence; those of barium sulphate and of hydrated calcium sulphate show weak birefringence.

After examination the filler is described, a little iodic acid is added to the drop and allowed to disolve. Effervesence shows the presence of carbonates. If calcium is present, either as the carbonate or as the sulphate, calcium iodate separates as elongated octahedra having symmetrical extinction and strong double refraction[1]. If barium carbonate is present, barium iodate separates in bunches of prismatic needles that are often curved. They, too, have strong double refraction, but an extinction angle of about 30 degrees. It may be necessary to start crystallization by scratching the slide with a glass rod, as the iodates of calcium and barium tend to form supersaturated solutions.

Magnesium can be detected by adding to the same drop ammonium chloride, sodium phosphate, and ammonium hydroxide or sodium hydroxide. This test, which has been mentioned before, is usually successful when applied to the drop after testing with iodic acid, and without further treatment, but it is safer to evaporate twice with hydrochloric acid, and to dissolve the residue in very dilute hydrochloric acid before making the test.

If the ash contains barium sulphate, its presence will not be shown by the test with iodic acid. Another small portion of the ash is added to a drop of sulphuric acid on a microscope slide, and the slide is heated over a micro-burned until the sulphuric acid becomes concentrated and gives off fumes. Upon cooling, barium sulphate will separate in characteristic crystals. At the same time, any calcium that is present will crystallize as the sulphate, but the crystals are quite different from those of barium sulphate.

This procedure, which can be followed in five minutes, permits recognition of all of the paper fillers identified by the standard method, and of silica and diatomaceous earth. It also distinguishes between the natural and the artificial fillers.

Heat changes the form of calcium sulphate. Therefore, to distinguish between the different calcium sulphate fillers, it is necessary to obtain some of the filler without burning the paper. This can be done by disintegrating the paper in water, removing the fibers by pouring through a sieve, and allowing the filler to settle, or it can be done more quickly by teasing apart a small piece of the paper in a drop of water, on a microscope slide, and then removing the fibers by means of the teasing needles.

Crown filler ($CaSO_4.2H_2O$) consists of crystals in the form of prisms with truncated ends; these are frequently twinned to form the charcteristic "arrowhead" crystals. The crystals have low indices of refraction, weak birefringence, and an extinction angle of 37 degrees. Natural gypsum has similar optical properties, but can be distinguished by its irregular, broken grains. Pearl filler (partly dehydrated calcium sulphate) retains some of the form of the original crystals, but the particles show that they have been partly disintegrated by heat. The birefringence is strong, and the index of refraction is much higher than that of hydrated calcium sulphate. The fourth variety of calcium sulphate that is in general use as a paper filler, is made, as I understand, by heating the natural gypsum to an extremely high temperature. It consists of tiny crystals having very strong birefringence and high indices of refraction.

If it is desired, the results obtained by this method can be confirmed by other microscopic qualitative tests, by refractive index determinations, or by a careful examination of the optical properties of the filler.

In describing the microscopic methods of analysis, I have intentionally omitted the details of procedure and descriptions of the reaction products, as an attempt to crowd them into a limited space might make them misleading. The references should be consulted for complete information regarding these tests.

Proven Value of Microscopic Analytical Methods

I wish to close with a bit of personal testimony. I spent a year at Cornell University in order to study the methods of chemical microscopy under Dr. Chamot. Even before I finished the courses, people that believe only in traditional methods predicted that I would find these methods impracticable. You can imagine that I was anxious to see whether they would prove to be a real help.

My work at The Aetna Paper Company has been essentially practical. We have no opportunity to indulge in fine spun theories nor time-consuming methods. The conditions have been ideal for testing the value of the methods of chemical microscopy. When a problem arises, I turn immediately to the microscopic methods because I have found that they give more rapidly and more certainly the information for which I am

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seeking. They have permitted analyses for which there would have been no time otherwise, and they have furnished information that could not have been obtained by qualitative analysis alone.

Many who wish to use microscopic analytical methods may be deterred from doing so because they feel, when they are trying to solve a problem, that they dare not trust the results of methods with which they are not familiar, and that they have not the time to become familiar with microscopic methods. I suggest that they first read the "Handbook of Chemical Microscopy." The methods and applications will be a revelation. Then, I suggest that they try one or two tests at a time to check the results of the analyses that they make according to their usual methods. It will not be long before they will feel confidence in the microscopic methods and in their ability to use them. The time that these methods will save will more than repay them for their efforts.

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Starch in Papermaking[1]

By J. P. STRASSER
Stein-Hall Manufacturing Company, Chicago

UNDER the heading of Starch comes the group known as farinaceous carbohydrates, including corn starch, tapioca flour and potato starch.

I will touch briefly on the markets and supply of starch.

Corn starch is produced from corn. There is not only the local market in the United States to consider, but conditions all over the world. Foreign crop conditions and consumer demand affect the price per bushel of corn. Corn starch is only one of the products of corn, others being starch oil, feed sugars and corn syrup, the demand for which, to some extent, influence the price of corn starch.

As far as tapioca is concerned, it is produced in Java. This country consumes about 60 per cent of the supply. Prices depend upon crop conditions, the supply in other countries, and consumer demand in industries other than paper.

Potato starch at one time was the starch used in the industry, but in the last twenty or thirty years corn starches have replaced them, because the value of the potato as food in this country has made the price prohibitive for use in the paper mill.

These so-called ordinary starches are used in the paper industry mainly as pastes and adhesives, and to some extent in the beater.

The stage in the starch industry when the ordinary starch has been produced might be compared to the point in your production when you have produced your pulp. It is an intermediate product.

The conversions of starches or modifications are innumerable. This is a degeneration or breaking down, the products of which are: thick boiling, thin boiling, gum starch and dextrinized starches.

This is a rough picture of the background of the sources of supply.

[1] Paper read at the meeting of the Michigan Division of American Pulp and Paper Mill Superintendents Association, held at Kalamazoo, Mich., January 16, 1930.

Application of Starch in the Paper Industry

Before going further, I want to define one term that is used frequently, "size."

As the starch manufacturer understands "size," he understands it as a material which has a definite value, in some ways, as a filler, finish and stiffening agent. As the papermaker understands "size," he thinks of waterproofing. To that extent, starch is only a filler; it is not a size. As a matter of fact, it has been definitely proven that as far as waterproofing value is concerned, you get nothing from starch. Starch, as such, has no waterproofing value in paper.

The principal uses of starch in the paper industry are: in the beater, tub sizing, coating, and to some extent in the water box.

The determination of the cost and value of starch used as a tub size or coating adhesive is relatively a very simple problem, compared to the problem of determining the value of starch in the beater. Variables are less, and results, of course in the case of tub sizing, are more directly apparent and much easier to ascertain.

To some extent, the use of starch in the beater is the result of theory and application of theory.

We have found the application in the textile industry, and to some extent in tub sizing, of various types of starches by which we procure sizing value; certain types of starches that will give us a good stiff sheet, those with which we can procure a good "rattle." Other types of starch will give us improved strength, possibly improved folding and, as compared with the before mentioned product, not so much rattle.

In applying these special starches to the beater, clearly defined results are not always obtained. Some papermakers used to say that putting starch into the beaters was throwing money into the sewer, and to some extent they were correct. However, the starch industry, in the last few years has awakened to the need of the papermaker. We have perfected our product and we have been able to prove definitely that over a period of time, in certain types of paper, the use of starch in paper is beneficial. We have not been able to put our finger on something and say, "Look at this sheet; this is what starch is doing," but our general experience has been that the use of starch tends to improve the finish, or help the strength of a sheet, and over a period of time, this is being accomplished.

Recommending a certain type of starch for use in the beater, as I have said, is not always definite. We know that when we take a certain type of starch and run textile material through it, such as thread, etc., it will do certain things to the fiber, and we can definitely say through tests just what it has done, and what the characteristics of the starch are. Using that as a foundation, we can say that we know that this type of starch will do certain things under certain conditions, and where like conditions are produced, the use of that starch should tend to function the same.

While we cannot always definitely prove to the papermaker that he should use starch or should use a certain kind of starch to get a definite result, we must go back to our experience with that starch in something where the results are shown more definitely.

Starch is used in the beater, as I said before, to improve the bond of the sheet, to increase the strength, and as a filler, it helps the finish.

The purpose for using starch should be analyzed, and the product used should be the one the experience has shown has the desired characteristics.

In addition to fulfilling the purpose for which it is used we are now trying to get that starch into such form and shape that it can be handled easily and in the most economical fashion.

One of the recent developments in connection with starch is the factor of "dirt control." We had several mills ask us, couldn't we get them cleaner starch, we thought we were supplying "clean starch." To prove their point, they ran the starch through a 60-mesh wire, and found that the starch contained considerable dirt. As a matter of fact, the dirt in the starch was sometimes worse than the dirt in the pulp or furnish. They wanted to know if we could "clean the starch."

KRAFT PULP

K. H. B. — UDDEHOLM — WIFSTA WARF
OBBOLA — DYNAS — LION

UNBLEACHED SULPHITE

SKONVIK — WIFSTA WARF — FORSS

BLEACHED SULPHITE

TOTEN — UDDEHOLM — THURBO

EASY BLEACHING SULPHITE

MJONDALEN

Perkins-Goodwin Co.
ESTABLISHED 1846
551 Fifth Avenue
New York

We made a few experimental runs and turned out starch that, from a standpoint of screening, screened 99.7 per cent pure. The percentage of dirt was almost negligible. However, in following the starch through the paper mill, we found that it was necessary to screen it just before it went into the paper. The starch in transit and through the length of the beater room, picked up considerable dirt. The analysis of that situation was simply that it would cost more to provide cleaner starch for the paper industry. After making a number of experimental runs, we found that the starch was still not clean enough to satisfy the paper industry, due to conditions beyond our control. Then it was a question of cleaning up the starch just before using.

Quite a few of the mills are now making a cold water solution, which means mixing it with cold water and running it over a 60-mesh wire before cooking it. To a great extent, this has removed the fear of dirt coming from the starch, and removed one dirt factor. They can feel certain that the starch is clean, and this leaves them free to look for the dirt from other sources.

The methods of handling starch in the beater room are showing quite a bit of improvement. This is done by making large quantities. They are making starch in anywhere from 500 to 1,500 gallon batches. They screen it before they cook it and pipe the solution to the beaters. This simplifies the problem of handling to a great extent.

Some mills who are much smaller users of starch are cooking it in a barrel. They make a cold water mixture and screen the solution into the cooking container.

How Should Starch Be Used?

This brings us to one of the most contested points about starch in the industry:

How should we use Starch?
Should we use it dry?
Should we partially cook it?
Should we cook it?

This brings us back to the point that there are different types of starches. Some work better for certain purposes than others. In regard to cooking starch, we believe that papermakers are using starch to assist in securing finish, control of fuzz, to help formation to some extent and as a binder to bond fibers together and strengthen the sheet.

For these purposes, the best assistance is not obtained by putting the starch in dry. The theory is based on this factor: in putting it in dry, there are innumerable starch cells which are not adhesive, cohesive or calloidal. The sheet is formed with the inert material distributed through the sheet.

The theory of beating is that we try to get the stock in such shape that a mucilaginous film forms on the fiber. Because of insufficient beating capacity or the cost of the operation, we cannot always condition the stock to the point where the utmost is obtained from it. Cellulose has not the same chemical structure as cooked or jellied starch but it has many physical properties which are identical. So in adding the cooked starch, you are making up for some deficiency in stock conditions and using the cohesiveness or filming action to the best advantage. Starch swells tremendously, and when the percentage of starch used in the beater is considered, 1 per cent to 2 per cent of the total amount, on a dry basis of the furnish, constitutes a colloid, which due to expansion, functions to a greater extent than the proportion on a dry basis seems to indicate, On the other hand, using it dry, you lose the filming action. From the standpoint of retention, the tests made show more retained starch when used dry than cooked. On the other hand, the benefit gained from the cooked starch is so much to the advantage of the sheet, that the slight loss in retention is gained in other ways. Another point in that connection is simply that starch is not used for the purpose of retention.

The Economic Factor

The starch industry is in the same position as the paper mill—How can it justify the use of a product which costs more than the paper produced from it? Look at it in this way: Take a mill for example that is paying $120.00 per ton for starch used in a sheet selling for $90.00 a ton. Based on 2 per cent, the mill is using 40 lbs. of starch per ton of finished paper, the starch costing $2.40. Assume the sheet retains 50 per cent, the mill is selling 20 lbs. of starch costing them $2.40 for $0.90. What justifies the expenditure of that $1.50? The expenditure is believed to be justified by the improved quality defined as better finish, formation, or strength. These qualities could be obtained by changes in beating, jordaning or furnish, but that in some cases is more expensive. When the stock is beaten the proper length of time, a mucilaginous film forms on the surface of the paper. Cellulose and cooked starches are both carbohydrates. Some of the film otherwise obtained through beating of the fibers, is now obtained through the addition of starch. In other words, instead of considering starch as furnish cost altogether, it should be considered partially as "cost of beating."

It has been proven that something is accomplished by the addition of starch to the beater. Special types of starch are helping. Unfortunately, it cannot be shown in dollars and cents, but several of the mills have satisfied themselves that a proper percentage of starch does pay.

New and Better Starches

About eight years ago, the use of starch in paper mills took a tremendous decline. At that time, they were using ordinary starches; paper mill speeds had been pretty well stabilized, and they were producing a quality of sheet that was satisfactory. They started to look for some ways to cut corners, and found that if they eliminated starch, in a great many cases, they had just as good a sheet. However, since that time, the industry has speeded up. In speeding up, some of the previous co-ordination has been lost.

The starch industry was faced with a decline in the consumption of starch. They tried to determine if they couldn't produce something more satisfactory than the material, the use of which was rapidly declining. They found that they could not make anything cheaper, so they were compelled to go the other way. They made something better, but in so doing increased the cost. In making a better product, its cost was increased materially, but this was more than made up by increased efficiency. That, practically, is the reason the paper industry is being solicited by the starch industry on new starches of new qualities.

Another point that was discovered in the research work on starch was that a definite relation existed between the length of beating time and retention of the starch. It was found that up to a certain point, using standard stock, standard speed, etc., that the longer the beating time, the greater was the retention of starch.

It was also found that the precipitation of Rosin Size caused the starch retention to jump enormously, which indicates that rosin size and starch work well together. We believe that starch diffuses rosin size better and tends to help the formation of a more uniformly sized sheet.

Several reasons why these new starches are working so well are better distribution and diffusion, better filming action, and better retention, in most cases, than there were in the ordinary starches of a few years ago. Another point discovered was that each of these starches had a maximum efficiency point. The use of starch to control fuzz, for example, comes within a certain limit; using more is putting it into the sewer. The use of starch to strengthen a sheet requires a lot more than is needed for fuzz control. Starches used in different proportions will help both of these factors which indicates some of the reasons why paper mills today are gradually increasing their consumption.

Starch in Tub Sizing

The use of starch in tub sizing is an entirely different problem. The practical purpose of tub sizing is to provide a writing surface. A tub sized sheet is a pen and ink sheet as compared to printing paper. Starches are used to help the erasure test, to give uniform writing surface, control feathering, give more rattle, help strength and increase fold.

We find that we cannot take any particular starch and have it work as a good tub size for every type of paper, any more than we can with beater size.

Considering the various types of sizing, the product made from tapioca will give a better folding sheet; the product

glassine and greaseproof

BUSINESS receives most of its dignity and much of its charm from the integrity of its commodities and the spirit of its service. When alert and balanced intelligence is given everything with which to produce commercially sound products it invariably succeeds. When, too, it realizes that service is based on a sympathetic understanding of a customer's needs it builds a strong clientele.

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made from corn will give a stiffer sized sheet, with more rattle.

Offset papers, or papers to be tub sized for printing purposes, is another factor. Instead of testing with water, the oil test is a much more important factor. Several mills make what is termed "Margin papers." These papers could be either engine sized or tub sized and be satisfactory for the purpose. The reason is that on some of these printing papers, the dilution of the starch in the tubs is so great that you can practically accomplish the same result through engine sizing. In the case of two mills, they actually changed their specifications for some papers from a tub sized sheet to an engine sized sheet. When they made that change, their starch cost went up. It actually cost much more to use starch in the beater than in the tub. This is offset, however, by the increase in speed and production.

Starch in Paperboard

Within the last two or three years, new developments have taken place in the board mills. Starch is being used in the waterbox instead of in the beater. In container liner, and in some cases patent coated board, starch has recently been used in the waterbox to control fuzz. The starch industry has found that the use of certain starches in the waterbox costs from 6c to 10c per ton, as compared to $1.50 to $2.00 per ton, when used in the beater.

In Patent Coated Board there is use for starch other than for fuzz control. Most of it has to be printed and it has been definitely proven that starch gives a distinct advantage in printing because of its function as a filler in giving more uniform surface. It has a distinct attraction for ink—a greater attraction than fiber.

Starch in Coating Paper

The use of starch for coating is still in its infancy. There are certain types of paper which we believe will always be casein coated. We hope some day to find a way to produce a waterproof starch. What we are doing now is to analyze the use to which paper is to be put. We are going past the paper mill. Probably hundreds of tons of paper which is casein coated today would work just as well starch coated, and in some instances much better than casein coated. We are finding out just what types of printing a starch coated paper will handle, and think that in the long run we will be able to produce a sheet which the printer will not judge on the iodine test but on its printing qualities.

In conclusion, I wish to say that the main thing in connection with the starch proposition is to proceed intelligently. The paper mill will benefit and the starch industry will benefit. There are economical and practical reasons for the use of starch in the industry. By working closely with the industry, we can prevent its abuse.

An Accountant's Study of Marketing Costs

Report of a Talk by E. S. Freeman Before the Connecticut Valley Division of the Cost Association

THE Connecticut Valley Division of the Cost Association of the Paper Industry met on Monday, February 24, at the Hotel Nonotuck, Holyoke, Mass. The speaker of the evening was E. Stewart Freeman, chief statistician, Dennison Mfg. Co., Framingham, Mass., who gave a painstaking and interesting talk on "Manufacturers' Marketing Costs," drawing the material presented from the system in use at the Dennison Company.

Hindrances to a Scientific Study of Costs

In spite of the amount of money involved, slow progress had been made in the scientific study of marketing costs, Mr. Freeman declared, because of three facts:

1—Many variables are involved and many figures are required before we can get adequate costs.

2—The numerous figures required are difficult of attainment.

3—It is difficult to interpret what figures are collected into terms of definite action. An error, for example, in marketing costs is apt to be much more serious than one in manufacturing costs.

Relation of Special Orders to Total Business

Before going on to describe the system in use at Dennison's, Mr. Freeman gave an idea of the problems involved by citing certain figures. He said that 6,000 items were carried in stock, and that about half the firm's business consisted of special orders. The annual business of $16,000,000 a year represented 400,000 orders sold to 75,000 customers. These orders ranged from less than $1 to more than $10,000 each, the average being about $40.

Division of Marketing Costs

Mr. Freeman divided marketing costs into two groups: (1) The cost of getting the order, and (2) The cost of filling the orders.

Costs for filling the order could be figured in much the same way as manufacturing costs, as they were necessarily of a routine nature. Owing to the use of budgets, it was possible, by determining the difference between actual costs and budgeted costs, to estimate the efficiency of the various departments involved. The difference between the actual cost and the budget was carried to Profit and Loss, Mr. Freeman said.

Use of Order Filling Costs

Order Filling Costs are used to get the profit by merchandise lines, through the working up of a standard Order Filling Cost for each kind of product. (The 6,000 items previously mentioned are grouped into 300 lines.) This cost is added to the manufacturing cost; the result deducted from the sales value gives the gross profit for the class under consideration.

Mr. Freeman gave details to show how standard order filling costs were assembled. In general the method is this: all possible items of expense are listed and are then grouped into nine different factors, which are used to measure the office and warehouse costs.

Cost of Selling by Salesmen

Next came a discussion of Order Getting Costs, and first the cost of selling by salesmen. Back in 1920, a time study was made of a salesman's efforts, and it was found that only 15 to 20 per cent of his time was spent actually with customers. Through better planning of the salesman's time and the elimination of clerical detail it had been found possible to increase the proportion of time spent with customers. The next effort was to get figures showing the result of adding to or subtracting towns or customers from salesmen's routes, or by making substitutions.

Solving the Problem

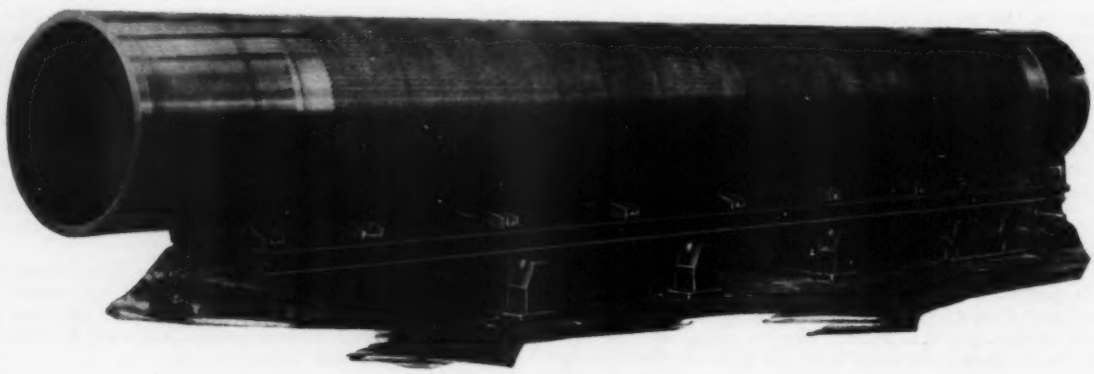
A number of formulas have been worked out which are used to solve these problems. The net yield of a town is the difference between the direct cost of selling the town and the gross yield from sales made in that town. To be continued in a route, a town must show either a net yield or the promise of one. No town would be substituted for another, unless the same expense would produce an equal or better net yield.

Among the factors which might be mentioned as aids to increasing net yield were: (1) Covering the town less frequently; (2) shortening the stay in the town; (3) traveling by automobile instead of public utilities, or vice versa. In large centers the cost of selling a town is broken down by getting selling costs to customers.

Recording Advertising Costs

In regard to advertising costs a careful record should be kept of the inquiries received from each insertion. The cost (less the gross profit on any booklet or material sent out in response to ten or twenty cents sent in with inquiries) of the advertisement, divided by the number of inquiries gives the cost per inquiry. Comparative costs show the efficiency of various advertising mediums and advertisements. Practically the same methods are used to get the cost of inquiries from various types of mail order letters.

PRESENT DAY COMPETITION DEMANDS THE BEST



Cut shows 44" diameter drilled Suction Couch Roll Shell, rough weight 20 tons, 330 inches long. Cast by Sandusky Centrifugal Processes.

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Costs obtained by the methods listed above are used to determine the returns from different classes of customers, as well as the returns from different classes of goods, and are allocated in the manner which best presents the information desired.

Judgment in Selling

At this point, Mr. Freeman pointed out that it was sometimes advisable to sell an article, which in itself brings in no profit, but which is sold in conjunction with other profitable items.

In conclusion, Mr. Freeman showed how marketing cost and selling price are related, and demonstrated how, from a cost standpoint solely, certain elements of the cost may be omitted, and as a result prices lowered in periods of temporary general depression.

It is true that marketing and selling costs at the present time have very little influence on market value, but even so, an intensive study of this problem might result in a decrease in costs and a resulting increase in profits. This would force competitors to do the same and so the practice of this study in marketing costs would continue to spread.

Pacific Coast Safety Meeting

First Meeting Held—Powell River Company Hosts—Pacific Coast Section of National Safety Council Organized

UNDER the chairmanship of R. H. Scanlon of Powell River Co., Ltd., Powell River, B. C., Canada, recently appointed Pacific Coast regional director of the Pulp & Paper Section of the National Safety Council, mill representatives from Oregon, Washington and British Columbia convened in Powell River on Wesnesday, February 12, for the first meeting of this kind to be held on the Pacific Coast.

The conference was attended by over twenty delegates, in addition to the various safety committees of the Powell River plant, and all were unanimous in their enthusiasm over its outcome. The Powell River Company, who were hosts to the visitors, had prepared an extensive program of entertainment which kept the delegates occupied throughout the day.

After a tour of inspection through the Powell River plant, the visitors were entertained at a special luncheon in the Hotel Rodmay. In the afternoon they were driven in cars about the townsite and the surrounding district.

At 4:30 o'clock the delegates gathered in Dwight Hall for the first general conference of the day. This was an open meeting and a large attendance was present to hear the speakers at the afternoon session.

Mr. R. H. Scanlon, regional director, in opening the meeting explained that this conference was the first step in the organization of a definite Western Division of the National Safety Council. At a special session, held earlier in the afternoon, tentative arrangements had already been concluded. Conferences would be held at least twice a year in different coast mills, and an organization committee had been appointed, consisting of Oscar A. Jorgenson, B. C. Pulp & Paper Company, Vancouver, B. C.; Phelps Dodge, Oregon Pulp & Paper Co., Salem, Oregon, and Paul Rozell, Inland Empire Paper Co., Spokane, Washington. The chairman appealed to all non-member mills to fall in line and "enlist in The National Safety Council Accident Prevention Army." He felt that the co-ordination of effort and the efficient, continent-wide organization of this body brought a concentration to bear on the industrial accident prevention problem, that was impossible in the individual and often disunited efforts of single plants.

Business Session

The principal speaker at this session was Major Steere Clarke, safety director of the B. C. Loggers' Association. Declaring the conference as "a red letter day in British Columbia industrial history," he outlined the development of safety as a study of international importance, instancing the splendid efforts being made in the dissemination of safety doctrine by the international organization now established at Geneva. Defining safety education as a "science of common sense," Major Clarke stressed the work being done to make the logging industry of B. C. safety conscious. He made the significant statement that as a result of carefully checked statistics, only one and one-half per cent of the accidents in the logging industry of the province could be traced to defective machinery, and that over 96 per cent were directly

Delegates photographed on Powell River War Memorial Site prior to entering Pacific Coast safety conference

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QUALITY— The base of all of our papers is the slowly cooked, long fibered Mitscherlich Pulp, which is manufactured from the finest quality of Spruce, brought down from northern Canada by our own boats, the largest fleet of pulp wood boats in the United States. The quality of Detroit's products is thus positively controlled by us in every detail from the woodlands to the finished paper.

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attributable to the human and preventable factor. He, as director of the B. C. Loggers' Association accorded his full support to Mr. Scanlon in his efforts to organize a working division of the National Safety Council on the Pacific Coast, and congratulated the Powell River Company for their whole hearted support of the convention.

"Pyramiding of Safety Work," was the subject of the address given by Mr. C. Abell, manager of the British Columbia Safety League. The speaker declared that had the same efficiency of organization prevailed in the campaign against public accidents that was concentrated in industrial safety, deaths due to motor traffic, etc, would be a negligible feature of our lives today. Unfortunately, this was not the case and the public has not yet awakened to the terrible toll taken in public accidents. He startled many of his hearers with the statement that tuberculosis and cancer were yearly responsible for far less death and misery than those arising out of motor traffic and similar form of public accidents.

Mr. W. D. Jenkins, safety director of the B. C. Lumber & Shingle Manufacturers Association, and one of the earliest safety engineers in British Columbia gave the delegates a comprehensive and richly colored survey of safety activity in the lumbering industry of the western province. He emphasized the difficulty of inculcating safety consciousness in an industry which was largely nomadic and which embraced men of diverse and widely extended nationalities.

Mr. Frank Nello, Powell River Company safety engineer, concluded the afternoon session with a detailed summary of the work being done in his company to promote safe thinking and safe workmanship among the personnel. "The Powell River Company," he said, "have spared no expense in their efforts to have every possible piece of machinery adequately guarded and regularly inspected, and regular talks on problems of safety are held by foremen for the men in different departments. The plant is fully organized for safety, and the education of the employees in safe workmanship is an integral part of the managerial program."

Banquet

A banquet was held in the evening at the Hotel Rodmay at which the Powell River safety committees and foremen were also in attendance. Mr. John McIntyre, townsite manager of the Powell River Company had prepared for conspicuous

Powell River committee discussing the day's program, with L. R. Wood of Tacoma an interested spectator. Left to right: J. A. Lundie, editor; Powell River Digester; R. H. Scanlon, ass't res. mgr. of Powell River Company and Regional Safety Director; John McIntyre, townsite manager; Frank Nello, safety engineer

display an enlarged and illuminated replica of the National Safety Council emblem. In addition, special souvenir programs with a special safety menu were placed at each visitor's plate. Considerable merriment was injected into the proceedings when Mr. Scanlon read a number of bogus telegrams addressed to the visitors. Each visitor upon being introduced by the chairman, expressed a conviction that this first safety convention was a forward step in western pulp and paper history.

Mr. R. Bell-Irving, resident manager, was the chief speaker. In proposing the toast to the National Safety Council, he frankly stated that in safety matters, Pacific Coast mills lagged behind plants in the East, remarking, "I believe I am not unfair when I say that as far as efficiency in production and equipment is concerned, we in the West, are on a par with the East. From the standpoint of quality, we meet the East on level ground. In living and working conditions, our Pacific Coast mills are inferior to none. Our general standard of living and the type of employees on our pay rolls are also at least the equal of eastern organizations. We have in British

Principal speakers at the afternoon session. Left to right: Percy Abel, Major Steere Clarke, W. D. Jenkins

Columbia, a Workman's Compensation Act and a Government Inspection Service that is second to none on this continent, and our mills are equipped for the most part with strictly modern safety equipment.

"In spite of this," Mr. Bell-Irving continued, "in the matter of accident prevention, we have not as yet equalled the record of the average eastern mill. Why is this?"

It may be due," he said, "to the more compact nature of the mills there—their close proximity which enables frequent round table conferences, or it may be due in part to certain differences in methods of eastern and western manufacturing. I am inclined to think, however, that no little credit for the superior showing of the East in the question of safety may be traced to the greater activity of the National Safety Council in that part of the country.

"Whether this is the correct answer to our problem, I do not know. The fact remains, however, that in the regions where the National Safety Council is more active, a lower accident rate prevails. This in itself is very significant and would certainly appear to strongly indicate the desirability of stimulating Council activities in the West."

Mr. Bell-Irving stated that the Powell River Company was solidly behind the movement to organize the Pacific Coast Section of the National Safety Council, which honored Mr. Scanlon by appointing him regional director of the Paper and Pulp Section. "In conclusion," he said, "and subject to the decision of your committee and to any more deserving claim which may be advanced, I take this opportunity of inviting the Pacific Coast Division of the Pulp and Paper Section of the National Safety Council, to again convene in Powell River next year. If our invitation is accepted, we assure you, in advance, of a very hearty welcome."

Major Steere Clarke, in replying to the toast, energetically substantiated Mr. Bell-Irving's conclusions. Drawing a number of colorful instances from his long experience in the logging industry, Major Clarke felt that organization of the Pacific Coast mills as a working division of the National Safety Council, would greatly benefit industry on the Pacific Coast.

"There is one thing," he said, "that has struck me forcibly while spending this wonderful time in Powell River and that

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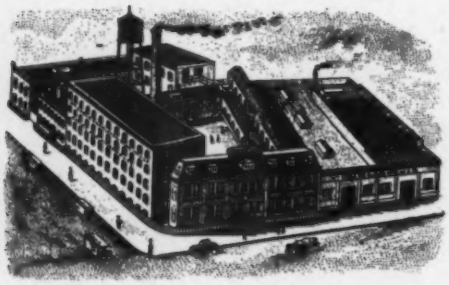

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is the loyalty of the men to the management. If you have this as a nucleus, you can do anything." He remarked the prudence in appointing Mr. Scanlon as Regional Director and reminded that the success of this safety movement became a job for every man, from the highest to the lowest.

"The question is," said Major Clarke, "how can we reach the rank and file? That is done through men chiefly like ourselves. I maintain that the superintendents and foremen are the backbone of the organization, and if they can exercise the proper amount of the leadership, they can generally lead these men into habits of caution. When a man once secures a sense of caution, he becomes a safety booster. You may convert a man who is antagonistic if you approach him from the right angle. Safety cannot be driven.

The toast to the visiting delegates was proposed by Joseph Falconer, assistant resident manager of the Powell River Company. Mr. Falconer spoke enthusiastically of the interest shown in the meeting and of the undoubted stimulus that such a gathering would give the industry on the Coast. Mr. Abell replied on behalf of the visitors.

R. H. Scanlon, in his concluding remarks, thanked the delegates for the co-operation they had accorded him, and assured his audience that, as regional director, he would leave no stone unturned to organize a definite campaign for safety among the pulp and paper mills of the Coast. He hoped later, he said, to see the organization embrace all industries.

The chairman said that in the Powell River mill they had found the greater percentage of accidents resulted from five main causes: (1) Infection from cuts, comprising 12 per cent of accidents; (2) Slipping which was responsible for nearly 15 per cent; (3) Pickaroons causing nearly 10 per cent of all casualties in the plant; (4) 10 per cent from fingers being caught between rolls and drums, and (5) Miscellaneous.

The "danger hours" he had discovered, lay between the hours of 10 and 12 in the morning and between 3 and 5 in the afternoon.

Concluding, the chairman said, "We should not only watch the danger hours, but we should watch the causes. I recommend that our firm study these things carefully and recommend that the visiting delegates make a similar study in their own plants."

At the conclusion of the banquet, the visitors were given three hearty cheers and the usual tiger.

A Development in Box Strapping

The Stanley Works, New Britain, Conn., is introducing to the users of strapping, a distinctive new product. Colorgraph strapping is an improvement in Eversafe, the round-edged, sterilized strapping which this company put on the market about a year ago. Both products have been developed by L. S. Howe of the Box Strapping Division of the Stanley Works.

In comparison with the earlier product which was somber-hued and confined entirely to the function of keeping containers intact and unbroken, Colorgraph has all the distinctive features of the former, and in addition, the high advertising value of trade-marks, firm names, slogans, etc., printed in brilliant colors on the strapping.

This strapping offers a very effective means of displaying instructions from shippers such as "fragile," "handle with care," "perishable," etc. These notices appear twice on each of the four sides of the container and are always in plain view. An appreciable saving is thereby affected in time and labor of stenciling.

National distributors may mark containers with slogans and designs used in advertising. Also, the losses from theft are reduced as it is the general practice among thieves to remove strapping and replace it with other strapping.

Quantities of merchandise, including steel, wire, lumber, flexible cable, pipe, etc., are shipped without containers or wrappings of any kind. Such merchandise is almost entirely dependent upon tags to show destination and shippers' address. If the tags are torn off, or become unreadable in transit, the shipment in most instances is lost. Colorgraph strapping carrying the shippers' name and address will prevent losses of this nature.

Cost Association of the Paper Industry

Proceedings of the Semiannual Meeting in New York

THE Cost Association of the Paper Industry held its semiannual meeting at the Pennsylvania Hotel, New York City, on Tuesday and Wednesday, February 18 and 19, which was well attended and characterized by the delivery of addresses, presentation of papers and discussions by men of prominence in cost accounting circles. At the opening session on Tuesday morning, President Ralph B. Hersey, of the Hollingsworth & Vose Company, Boston, Mass., gave an address of welcome, in which he took occasion to impress on members the necessity of co-operating in the work of the association so as to bring about greater uniformity in accounting methods. Remarking that cost meetings in the past had been notably successful for their discussions, he urged all to maintain the record, relate experiences and ask questions so that the general fund of information on correct cost accounting methods would be increased.

Joint Sitting with Salesmen

The Cost Association had a joint session with the Salesmen's Association of the Paper Industry shortly before noon when all listened to an address by Irving Fellner, publishing director of System, on "An Approach to a Marketing Problem."

At the afternoon sitting on Tuesday the speakers were Eric A. Camman, of Marwick, Mitchell & Co., New York and Prentiss B. Reed, of the Phoenix Assurance Company, New York.

Census News from a Statistician

At the morning meeting on Wednesday, J. A. C. Kavanagh, statistician of the American Paper and Pulp Association, described the methods adopted by the Government in taking the census of manufactures, particularly the census of distribution, a new undertaking which will cover about 2,000,000 establishments comprising wholesalers and retailers. He urged on all present to assist in making the census of distribution as complete and useful as it was intended to be.

Speeches at Annual Luncheon Meetings

George S. May, president, George S. May, Inc., Chicago and New York, delivered an address on "Bonuses and Their Uses to Decrease Costs and Increase Profits" which was well received and elicited some discussion.

In the afternoon, the annual luncheon meeting for executives took place and was well attended. Col. B. A. Franklin, vice president of the Strathmore Paper Company, acted as chairman and introduced the speakers, first calling attention to some of the notable men in the paper industry who were present. The speakers were Dr. E. O. Merchant, statistician of the G. H. Mead Company and A. W. Ramsdell, of Batten, Barton, Durstine & Osborn, Inc., advertising agents, New York City.

Putting profit into paper was the subject of Mr. Ramsdell's address and he displayed remarkably expert knowledge of marketing research work, bringing a message to Cost Association members which was of real interest and greatly appreciated.

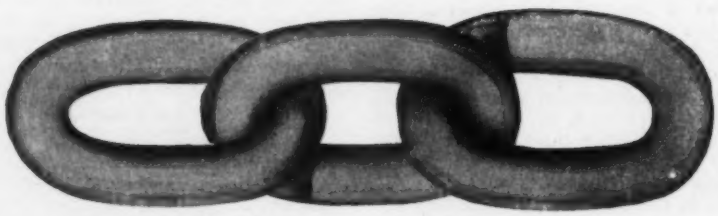
Forecasting the Course of Trade

Doctor Merchant is a regular speaker at Cost Association luncheons and his prognostications of future trends of business have been remarkably correct in all cases.

In his present talk, he made a comparison of business in 1929 and 1930, pointing out that a year ago in February we were approaching the finish of a long upspring in business that began in December, 1927, when Henry Ford started production on his new model. Production was heavy in all industries, labor was generally well employed at high wages, agricultural conditions were improving and the purchasing power of the general public was greater than ever before. It was a period of exceptional prosperity.

A Contrast in Conditions—He then contrasted present-day conditions when we are emerging from a severe business recession, production subnormal, unemployment large and the

CHAIN



Copper—Bronze—Brass—Nickel-Silver metals are Non-Corrosive and Non-Magnetic and do not have to be replaced

Use chain made of these metals in your mill and relieve yourself of further maintenance worry with the knowledge that the initial cost is the only cost.

These metals do not have to be scraped and painted and they last almost indefinitely besides being capable of withstanding great strain and retaining their strength and appearance.

For over a quarter century we have been chain makers and the accumulated experience acquired by our twenty-five years in chain manufacturing is yours for the asking—no obligation. Chains made from sketches and blueprints. Let us have your inquiries.

EASTERN CHAIN WORKS, Inc.

309 East 22nd St. New York, N. Y.

ECONOMIZE by equipping with the BEST

It Pays to Consult Falk First!

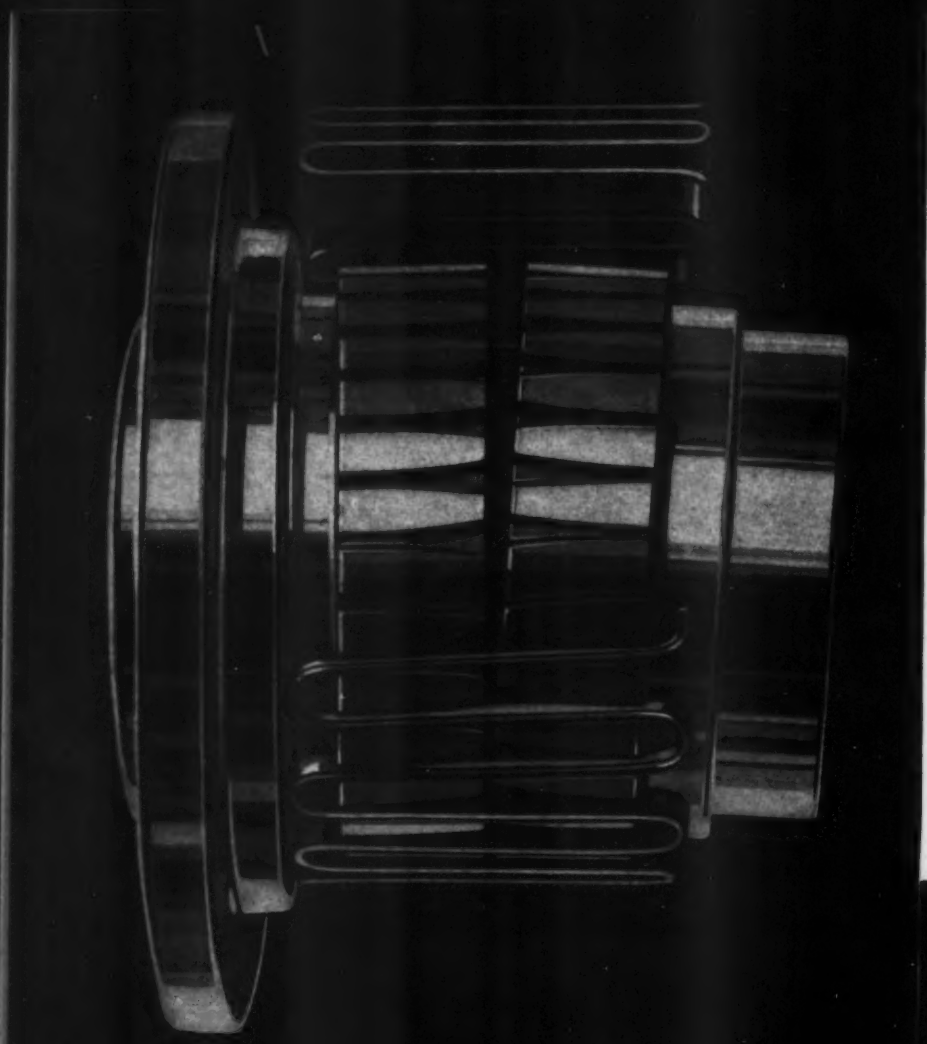
Falk Speed Reducers Are Vibrationless and Highly Efficient

Falk Speed Reducers are the choice of manufacturers who realize the necessity of skillful engineering for satisfactory speed reducer performance . . . Falk Speed Reducers utilize the famous Falk Herringbone Gears, which are specially cast and cut by a patented process exclusive with Falk — precise uniformity is thus assured . . . Falk Speed Reducers have 100% overload capacity for starting and emergency loads . . . They are dirt-proof, noiseless, free from heat and vibration . . . All wearing parts are interchangeable and renewable . . .

There is a Falk Herringbone Gear Speed Reducer for practically every kind of service, — made in standard sizes and ratios, and carried in stock for immediate shipments.

FALK

SPEED REDUCERS



What Falk Flexible Couplings Do!

Allow both lateral and torsional elasticity . . Are easily connected and disconnected . . Are all-steel . . . Provide widest distribution of pressure . . . Allow most correct lubrication . . . Float freely under load . . . insure greatest resistance to overloads . . . Absorb shock and vibration . . . Accommodate parallel and angular misalignment . . . Can be lined up quickly without special tools . . . Cannot rust . . . springs are packed in grease . . . Have no unreliable elements which lead to breakdowns . . . Operate equally well in both directions; either end can be the driver.

Other Falk Products — Gears, Speed Reducers, Oil Engines and Steel Castings

Steady Power Delivery Assured by Falk Scientific Construction

The spring and groove construction of Falk Flexible Couplings permits a degree of lateral and torsional resiliency obtainable in no other coupling . . . It compensates for angular and parallel misalignment so common in operating machinery . . . It provides a large measure of dependability. Falk design and Falk metals unite to successfully resist the stresses and strains of great loads . . . Smoother operation, longer machine life and increased production are desirable benefits that invariably follow a Falk Flexible Coupling installation . . . Obtainable from stock in a range from 1/5 Horsepower to 18,000 Horsepower at 100 R.P.M . . . Soon obtainable from leading mill supply houses.

Send for Bulletin No. 180.

THE FALK CORPORATION — Milwaukee

NEW YORK	WILKES-BARRE	AKRON	CHICAGO	BIRMINGHAM	SEATTLE
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FALK

PRINTED IN U.S.A.

FLEXIBLE COUPLINGS

purchasing power of the factory and city population very much reduced.

The automobile industry is generally taken as an index of business conditions, the saying being that "as goes this industry so goes general business." The reason for this is that the automobile industry buys huge quantities of materials from numerous other industries and employs a great army of workers. The building industry comes next but it is much more stable.

Position of the Automobile Industry—The automobile industry now has the largest sales volume of any industry in the United States. It employs something like 4,300,000 men and consumes a considerable proportion of the entire output of various other industries, such as steel, rubber, plate glass, copper, lead, nickel, hardwood, lumber, etc.

Doctor Merchant said that automobile production during the first half of 1930 would be about 75 per cent of the output for the first half of 1929, but for the second half year production will be fairly close to that of 1929, any losses during the third quarter being offset by gains in the fourth quarter.

It was the same with the building industry. Here the recovery in its initial stages is not likely to be rapid or well sustained but the second half year will be much better than the first.

Favorable Factors Instanced—Doctor Merchant instanced some favorable factors in the situation as tending to demonstrate that the worst of the recession in trade is over and we may look for a rapid recovery during the second half of 1930, especially if the new crop conditions are favorable.

Conditions in Our Own Industry—Surveying conditions in the pulp and paper industry, he pointed out that the consumption of paper will increase as business expands but with a lag of several months. His forecast of this a year ago was approximately correct for the first half year but a little too conservative for the second half year because business did not recede during the third quarter as rapidly as expected.

He gave it as his opinion that the consumption of all grades of paper for the first half of 1930 would show some loss as compared with the first half of 1929. In the third quarter consumption should be about equal to that of a year ago, while for the fourth quarter it seemed pretty certain that gains would be in evidence, large enough to offset the losses of the first half year.

Outlook for Pulp—The outlook for pulp is not considered so good. No increase in the consumption of chemical pulp can be expected, whereas mill capacity on the West Coast and in the Scandinavian countries, especially in the case of bleached sulphite will show a substantial increase. Prices have already broke sharply and, while they may not go any lower, they are not likely to strengthen much in 1930.

Prices and Profits—Prices and profits in 1929 were unsatisfactory though consumption showed a healthy increase. The mills had little to show at the end of the year for the big volume of business done. Doctor Merchant summed up the situation by saying that the paper industry stood today just about where it was a year ago, the fundamental difficulty being that most mills are dominated by production-minded instead of sales-minded executives.

Gibbs-Brower Member of the A. P. & P. A.

The Gibbs-Brower Co., Inc., New York City, paper and pulp mill broker and handler of used paper and pulp mill machinery, has taken out membership in the Supply and Equipment Section of the American Paper and Pulp Association.

This company is representative in the United States and Canada for the Jagenberg Paper Roll Wrapping and Paper Core machines made by the Jagenberg-Werke, Akt.-Ges. of Dusseldorf-Am-Rhine, Germany. It also represents Charles Koegel's Sons, Inc., manufacturers of circular knives, slitters and rotary knife grinders; the Specialty Automatic Machine Co., manufacturer of high speed automatic printing presses and special machinery; and the Flather Mfg. Co., manufacturer of automatic packaging, waxing, saturating and coating machinery, and handles in the East the Hermann Hercules jordan and Claflin refining engine.

Paper Merchants Hold Annual Meeting

K. S. Warner of New York Heads the Association for 1930

AT the twenty-seventh annual meeting of the National Paper Trade Association, held at the Hotel Pennsylvania, New York, on Wednesday, February 26, most of the officers who served during the preceding year were re-elected. "Kit" S. Warner, president of John F. Sarle Company, Inc., New York, who was vice president in charge of the Fine Paper Division, was elected president of the general association, and his place on the Fine Paper Division was taken by J. Frank Miller, of the Chope-Stevens Paper Company, Detroit, Mich.

The officers elected to serve during the ensuing year in addition to Mr. Warner, were: Arthur W. Blackman, D. F. Monroe Company, Boston, Mass.; vice president in charge of Wrapping Paper Division; J. Frank Miller, Chope-Stevens Paper Company, Detroit, Mich., vice president in charge of Fine Paper Division; Charles Addoms, Miller & Wright Paper Company, New York, treasurer; Frank E. Floyd, 420 Lexington Avenue, New York, executive secretary.

H. W. Mathewson, in his annual address as president, called attention to the good work done by the Fine Paper Division under Mr. Warner in improving the credit situation. The movement for better credit conditions was started in Minneapolis twenty years ago and has now been extended to outlying territories with full co-operation of adjacent markets.

Mr. Mathewson urged every paper merchant to establish a cost system. "Knowledge creates better conditions, ignorance makes conditions worse. Put in a cost system and gain that knowledge," was his advice.

The entertainment features of the annual meeting consisted of a theatre party and supper dance at Imperial Theatre and Hotel Astor, respectively.

Meeting and Luncheon of Paper Salesmen

Annual Election of Officers—Political Situation at Washington Reviewed

THE Salesmen's Association of the Paper Industry met in annual session coincidentally with other affiliated organizations of the American Paper and Pulp Association at the Hotel Pennsylvania, New York, during the week of February 17-20. After a general business discussion at the opening sitting on Tuesday, February 18, officers to serve during the ensuing year were elected as follows:

President—S. C. Knode, Albemarle Paper Company, Richmond, Va.; vice president, New England Division—Thomas Compton Walsh, Hollingsworth & Vose Company, Boston, Mass.; vice president, New York Division—Endicott Rantoul, International Paper Company, New York; vice president, Chicago Division—Harold Knott, of Chicago, Eastern Manufacturing Company; secretary-treasurer—Douglas A. Crocker, 18 East Forty-first street, New York.

Joint Sitting with Cost Men

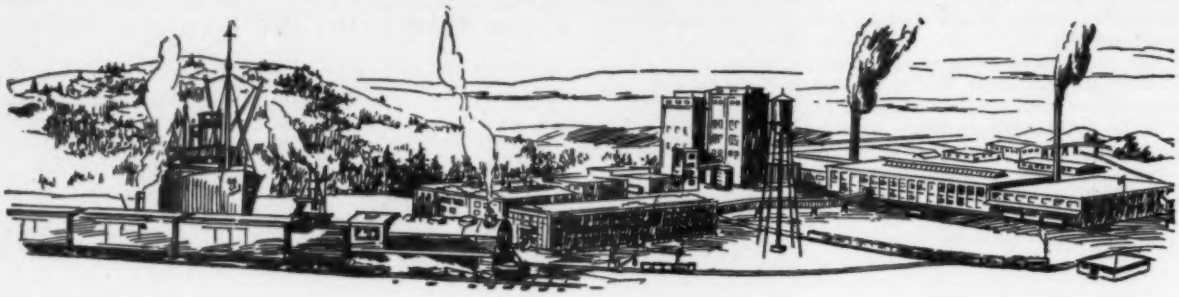
The salesmen were joined by members of the Cost Association of the Paper Industry at the close of the business meeting to listen to an address by Irving Fellner, publishing director of the magazine called System, on "An Approach to a Marketing Problem," which presented some new thoughts applicable to marketing problems of the paper industry. These related to the elimination of undesirable markets and concentration upon important sales outlets.

The Miami Valley Division of the Salesmen's Association is to be operated for the time being as a part of the Chicago division.

Tariff, Trade Practices, Etc.

The annual luncheon of the Salesmen's Association took place in the afternoon. The chair was occupied by S. C. Knode, president of the association. During the progress of the repast, music was furnished by an excellent orchestra and part songs were sung lustily to its accompaniment by the members.

The principal speaker at the luncheon was William M. Kip-



A national business ... *nationally handled*

WHERE wood exists in steady volume best quality and at lowest costs—there you will find a Union or affiliated *Pulp Mill.* Where freight-rates are most encouraging, skilled labor assured, quality up and costs down—there you'll find a Union or affiliated *Paper Mill.*

Where the supply of the correct bag-paper is best and at lowest costs, where carriage to trade-centers is quickest and cheapest—there you will find a *Union Bag Factory.*

Where business concentrates—there you will find a *Union Warehouse;* stocked by frequent factory shipments, constantly checked by experts for turnover and for completeness.

Where wholesale houses require the co-operation of a man skilled in every phase of coarse paper and paper bags—there you will find a resident *Union Sales Representative* ... of an efficiency that has become a watchword.

Not haphazard or by accident, but all arranged deliberately and with foresight. Not merely around New York or Boston or Chicago, but *nationally* ... between the two oceans and from Canada to Mexico.

These are unquestionably the reasons why, among wholesale paper merchants, it is regarded as a real distinction to become a part of the Union Sales Organization ... and to secure the benefits of a *national* connection.

UNION BAG & PAPER CORPORATION

Manufacturers of Wrapping Paper, Paper Bags & Paper Sacks

GENERAL OFFICES • WOOLWORTH BUILDING • NEW YORK, N. Y.

A HUMBLE member of the society of staples—a Union Paper Bag—but it can be the means to a steady, profitable line of business.

linger, senior member of the Kiplinger Agency, Washington, D. C., who was appropriately introduced by Chairman Knode.

Tariff Bill by April, Perhaps

Mr. Kiplinger gave a most interesting review of the political situation at the National Capitol. In regard to the tariff bill, he said it was the common impression in Washington that no tariff bill would be passed at this session of Congress, but he was of the opinion that one would be reported by April and there would be serious political trouble if one was not forthcoming at that time.

Higher Duty on Casein Predicted

For the benefit of the coated paper manufacturers he mentioned that the farmers are demanding that a duty be placed on casein and it was highly probable that the Senate would raise the rate to eight cents, though this would likely be cut down between the two Houses of Congress.

Most Industries Overproduced

There would likely be intense competition on all products because most industries were overproduced. As a matter of news he informed the gathering that the consumer of a certain material was going to the Federal Trade Commission and complaining that he was being discriminated against by a certain manufacturer who was giving low prices to a competitor. Mr. Kiplinger said he was unaware whether it was paper or not, but a test would soon be made. He said he hoped the paper industry would not be involved. As to the antitrust laws, these would not be amended for years, but cut-throat competition and unfair practices would be nosed out. These things were going to be straightened out by trade groups in conference with the Federal Trade Commission. The trade itself would agree as to what trade practices were proper and that would be the law.

Woodlands Section Meeting

Regional Reports Show Paper Industry Active in Forest Development

THE Woodlands Section of the American Paper and Pulp Association met concurrently with the other affiliated organizations at the Hotel Pennsylvania on Wednesday, February 19, a business sitting being held in the morning followed by a luncheon meeting in the afternoon. Foresters from the different papermaking regions of the country reported at the morning sitting. In all sections the paper industry was reported as being active in developing forest growth to provide raw material.

W. A. Munro Discusses Lake States Timber

W. A. Munro of the Munising Paper Company, presented an analysis of forestry in the Lake States. He said that forestry as a means of producing pulpwood in the Lake States was a decidedly promising business venture under the proper conditions. The costs of forestry are higher in that region than possible returns, but the economic chances of successful forestry were, he pointed out, distinctly good, capable of yielding returns as high as 5 per cent compound interest upon the investment.

The Lake States constitute one of the most important papermaking regions in the United States. Practically all of the pulpwood required to maintain the large production of paper is cut in the region.

There are vast areas of forest land in the region, which if used for forestry purposes, would yield much more wood than is now used. All of this land, however, is not economically suited to use by private owners because of the inaccessibility and poor fertility and restocking of cutover lands; companies should therefore exercise great care in selecting lands for forestry purposes.

Forestry Recognized in Maine

P. T. Coolidge, of Bangor, Maine, speaking for New England at the morning sitting, said that the practice of forestry was becoming a recognized program of all the paper mills in that territory with forest land being managed on a sound business basis. The chief difficulty in New England was, he said, the protection of the young trees from fire and insect damage. He estimated that the total growth in the pulpwood forests in New England could be increased to over 4,000,000 cords at a cost of approximately $1.40 an acre. The New England committee, of which Mr. Coolidge is chairman, has found that there is likely to be no shortage of pulpwood in New England.

Cheaper to Grow Pulpwood

John F. Preston, of the Hammermill Paper Company, Erie, Pa., gave it as his opinion that it was cheaper to grow pulpwood on lands near the mill in the Adirondack region than to buy it at present stumpage prices. He analyzed the economic opportunities of forestry in New York and Pennsylvania. There are approximately eighty pulp and paper mills in New York and Pennsylvania producing more paper annually than any other region in the United States. Adequate pulpwood supply was therefore a vital question. Mr. Preston's analysis brought out the fact that this region could continue to maintain its leadership by simple forestry and at the same time do it cheaper than using naturally grown wood.

R. S. Kellogg, chairman of the National Forestry Program Committee, introduced a lengthy series of resolutions for adoption by the Woodlands Section for presentation to the American Paper and Pulp Association for its endorsement, upon which suitable action was taken. Under these resolutions, the American Paper and Pulp Association will report its forestry activities through the Woodlands Section.

The present officers of the Woodlands Section were retained, George N. Ostrander, of Finch, Pruyn & Co., Glens Falls, N. Y., being re-elected chairman, and Charles W. Boyce, secretary-forester.

American Wood Pulp Importers Elect New Officers

The Association of American Wood Pulp Importers, the trade organization of concerns in New York importing wood pulp, sent a brief to the members of Congress, and an association committee appeared at the hearings in Washington on the proposed farm bill. Opposition was expressed to the imposition of a duty on wood pulp.

The annual meeting of the association was held in New York on February 6, 1930, when officers were elected to serve during the ensuing year, as follows:

President, George W. Oliphant, of Castle & Overton, Inc.; vice president, Orvar Hylin, of the Lagerlof Trading Company, Inc.; treasurer, William H. Anders, of the Perkins-Goodwin Company; secretary, R. D. Hull, of the Mead Sales Company, Inc., 230 Park avenue, New York; board of directors, Messrs. Oliphant, Hylin, Anders and Hull, and Orval A. Wales, of Johaneson, Wales & Sparre, Inc., last year's president of the association; national councilor, Howard E. Atterbury, of Atterbury Bros., Inc.; alternate national councilor, Frank C. Overton, of Castle & Overton, Inc.

Divisional Meetings

Affiliated Groups of Manufacturers Elect Officers

DURING the annual meeting of the American Paper and Pulp Association, the opportunity was improved by some groups of manufacturers to organize themselves for the consideration of mutual problems of merchandising.

The Kraft Paper Council met on Monday, February 17, with five representatives each of the manufacturers and merchants present. The Council intends to take steps to develop a broader market for kraft paper, as well as to put both the producers and distributors in an organization that can act for the good of the entire industry on merchandising problems. H. W. Ellerson, of the Albemarle Paper Company, Richmond, Va., is chairman of the manufacturers' group, and J. C. Mallalieu of George W. Millar & Co., New York, is chairman of the merchants' group.

Meeting of the Bag Council

A meeting of the newly formed Bag Council was held Monday afternoon with six representatives present, including the manufacturers of bag paper, the converters of paper in the manufacture of bags, and companies which both produce the paper and the finished bag. The members of the council are as follows:

WHERE TREES GROW TWICE AS FAST

---and there's more Profit in Paper

Steady forest depletion in other sections has turned the eyes of the paper and pulp industry to Georgia. For in this state are great reserves of forest, waiting to supply a need which soon will be urgent.

Searching for wood, the industry has found many things more in Georgia. Plentiful cheap clay for filler. Efficient labor—willing, adaptable, with the natural skill which is the Anglo-Saxon's heritage. Low taxes. Abundant and dependable power. Natural gas and cheap coal. Equable climate. Swift transportation by road, rail, water and air. These and many more factors are a big plus to the standing timber.

And that timber grows twice as fast. It requires only half the acreage to supply a perpetual source of pulpwood, and timber operations can be carried on throughout the year. Plants in Georgia can locate permanently and economically.

Paper is but one of the many industries to which Georgia brings great opportunity. We have made special surveys of Ceramics, Furniture, Rubber, Textiles and Full-fashioned Hosiery. We are rapidly completing others. And the information thus gathered is available to interested executives without charge or obligation.

If you are interested in better profits, write

INDUSTRIAL DEPARTMENT
New York office, 20 Pine street
Home office, Electric bldg.
Atlanta, Georgia

GEORGIA POWER COMPANY

INDUSTRY PROSPERS IN GEORGIA

H. W. Ellerson, Albemarle Paper Company, Richmond, Va.; C. R. McMillan, Union Bag and Paper Company, New York; P. M. Tallon, Hummel-Ross Fibre Company, Hopewell, Va.; E. E. Brown, Lawrance Bag Company, Middletown, Ohio; Alfred Bleyer, Alfred Bleyer Company, New York; J. N. Harvey, Advance Bag and Paper Company, Boston, Mass.

This council was formed in an effort to eliminate any misunderstanding between the three groups and to co-ordinate the three different types of companies involved in the production of paper bags.

Glazed and Fancy Paper Manufacturers' Association

The Glazed and Fancy Paper Manufacturers' Association elected officers as follows: President—John G. Van Horn, Holyoke Card & Paper Company, Springfield, Mass.; vice president—John McLaurin, McLaurin-Jones Company, Ware, Mass.; secretary-treasurer—L. I. Houghton, Springfield, Mass.; executive committee—John G. Van Horn, chairman; John McLaurin, I. O. Van Duzer, Louis DeJonge & Co., New York; R. N. Fowler, Hampden Glazed Card & Paper Company, Holyoke, Mass.; A. S. Guggenheim, United Manufacturing Company, New York.

Cover Paper Manufacturers' Association

At the fifty-seventh annual meeting of the Cover Paper Manufacturers' Association held on Tuesday, February 18, the following officers were re-elected for the ensuing year:

President—Col. B. A. Franklin, Strathmore Paper Company, Mittineague, Mass.; vice president—J. B. Shepherd, Peninsular Paper Company, Ypsilanti, Mich.; secretary-treasurer—E. H. Naylor, Springfield, Mass.; executive committee—Col. B. A. Franklin, Chairman; J. B. Shepherd, W. H. Howes, Knowlton Brothers, Inc., Watertown, N. Y.

Gummed Industries Association

"If your organization will develop new uses for your commodity you will have great opportunity for an increased market," said Irving Fellner, publication director of System before the Gummed Industries Association. "I myself have a fad of building model ships, and I make them by pasting together strips of gummed paper tape." The association elected the following officers:

President—W. E. Cerbrick, Central Paper Company, Menasha, Wis.; vice president—L. A. Bassett, McLaurin-Jones Company, Brookfield, Mass.; secretary-treasurer—Douglas A. Crocker, New York.

The standing committee on No. 1 Kraft Tape discussed the developing market for gummed tape in the shipping field, and emphasis was placed on the need for the maintenance of a high quality of tape. The use of the better grades of tape is recognized as important in the insuring of tape sealed containers against damage in transit. It is found that properly sealed containers are in increasing demand.

Binders Board Association

At a meeting of the Binders Board Association new officers were elected as follows:

President—J. P. O'Brien, Otter River Board Company, Otter River, Mass.; vice president—William Foulds, Jr., Colonial Board Company, Manchester, Conn.; treasurer—A. B. Goodrich, Riverside Mills, Glastenbury, Mass.; Secretary—O. M. Porter, Chanin Building, New York; Executive Committee—Edward Kerr, The Davey Company, Downingtown, Pa.; B. O. Trubee, Fandango Mills, Milburn, N. J.

Col. B. A. Franklin Heads Writing Paper Association

At the sixty-ninth annual meeting of the Writing Paper Manufacturers' Association, held on Wednesday, February 19, Col. B. A. Franklin, of Strathmore Paper Company, Mittineague, Mass., was elected president for the ensuing year. The following officers were elected to serve with him: vice presidents—G. S. Morse, Valley Paper Company, Holyoke, Mass.; C. B. Clark, Riverside Paper Corporation, Appleton, Wis.; secretary-treasurer—E. H. Naylor, Springfield, Mass.; executive committee—Col. B. A. Franklin, chairman, G. S. Morse, C. B. Clark, A. C. Gilbert, Gilbert Paper Company, Menasha, Wis.; H. W. Hixon, Chapin & Gould Paper Company, Springfield, Mass.; W. R. Howard, The Howard Paper Company, Urbana, O.; E. A. Oberweiser, Whiting-Plover Paper Company, Stevens Point, Wis.

National Kraft Paper Association

The National Kraft Paper Manufacturers' Association, after two days of discussion of program laid out preliminary plans for the organization of one of the strongest trade associations in the paper industry to include mills in the north, east, south and west.

Officers elected were as follows: President—Col. A. C. Goodyear, Bogalusa Paper Company, Bogalusa, La.; vice president—T. P. Schnorbach, Filer Fibre Company, Filer City, Mich.; manager—O. M. Porter, Chanin Building, New York; executive committee—Col. A. C. Goodyear, T. P. Schnorbach, H. A. Sheesley, Continental Paper & Bag Corp., New York; N. S. Stone, Mosinee Paper Company, Mosinee, Wis.; S. L. Bittner, Central Paper Company, Muskegon, Mich.; R. A. McDonald, Crown-Zellerbach Corp., San Francisco, Calif.; John E. Alexander, Nekoosa Edwards Paper Company, Port Edwards, Wis.; H. W. Ellerson, Albemarle Paper Company, Richmond, Va.

The association presented J. P. Hummell, the retiring president, with a silver plaque in recognition of his services in organizing the association and acting as its first president.

American Waxed Paper Association

At the annual meeting held during the convention of the American Paper and Pulp Association, officers for 1930-31, were elected as follows: President—W. J. Eisner, Newark Paraffin and Parchment Company, Newark, N. J.; vice presidents—W. L. Carter, Bread Wrapper Group; L. H. Croy, Household Rolls Group; B. H. Ballard, Glassine Group; E. W. Keeley, Tissue Group; A. Havenmeyer, Confectionery Papers Group; manager-treasurer—Paul S. Hanway, 342 Madison avenue, New York; counsel—Davies, Jones & Beebe.

In addition to the general meeting of the association five group meetings were held and constructive programs adopted by each group.

Tissue Paper Manufacturers' Association

The Tissue Paper Manufacturers Association is now established at 280 Madison avenue, New York. At the annual meeting, February 18, the following officers were elected; President—A. W. Cofrin; vice president—M. L. Dinkelspiel; secretary-treasurer—Herbert Thwaite; executive committee—T. B. Wheeler, B. F. Picola.

Supply and Equipment Section, A.P. & P.A.

Following a luncheon in the Hotel Pennsylvania on Tuesday afternoon, February 18, the Supply and Equipment Section of the American Paper and Pulp Association had a business meeting at which W. N. Wilkinson, president, described the activities of the association in the interest of American manufacturers of paper mill machinery, equipment and supplies. He expressed gratification at the increased interest taken in the section by supply and equipment manufacturers generally and acknowledged the benefits that had accrued from the closer identification of the organization with the American Paper and Pulp Association.

Jesse H. Neal, general manager of the American Paper and Pulp Association, was introduced to the members of the section and made a pleasing impression. After pointing out the advantages which the section now enjoys from being an integral part of the association he put in a cautionary word regarding the need of examining closely the qualifications of applicants for membership in order to make sure that firms of an established reputation in their respective lines were admitted.

Charles W. Boyce, secretary of the American Paper and Pulp Association, also addressed the gathering and made mention of certain service features under contemplation.

W. W. Cronkhite spoke on the importance of the constituent members keeping in close touch with the officers of the association in order to make the right use of their membership.

The waste utilization and stream improvement policy of the association was endorsed, after Arthur C. Bate, chairman of the committee of the section having this matter in charge had reported. Nearly all of the old board of directors were reelected.

TEXACO
LUBRICANTS

Reduce the cost of MAINTENANCE

The annual losses due to poor lubrication never appear on the balance sheet—but they are there just the same. A study of lubricating conditions within the plant will often show opportunities for surprising economies. It isn't a matter of cutting down on the cost of lubricants. Price buying of oils and greases is dangerous. It has been the experience of hundreds of mill operators that high grade lubricants with effective lubricating practices actually cost *less* per year.

The economies of effective lubrication are quickly evident. Texaco Lubricants recommended by Texaco Lubrication Engineers are saving thousands of dollars annually. There is a Texaco Lubricant for every purpose and the engineers of The Texas Company are experienced in every phase of paper mill lubrication. This service is freely available everywhere. Write The Texas Company first.

THE TEXAS COMPANY
17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

TEXACO
LUBRICANTS

Practical Helps for the Mill Man

Pipe Material Identification

A CURSORY examination of a piece of wrought iron or steel pipe does not readily reveal whether the pipe is wrought iron or whether it is steel. Tests have, therefore, been developed to make such identification easy. The file test is one that is frequently applied. In this case, a bright, smooth surface about 2 inches square is filed on the piece of pipe to be inspected. The pipe is wrought iron if the bright surface shows fine hair lines running parallel to the length of the pipe. If these lines are not present, the pipe material is steel.

An examination of the cuttings, while a length of pipe is being threaded, will likewise reveal the piping material. If the cuttings are in long coils, the pipe is steel. On the other hand, if the cuttings are broken into short chips, the pipe is wrought iron. A hammer test is commonly given to pipe which has been galvanized.

If a piece of galvanized pipe is hammered repeatedly to the point where it flattens out, the galvanizing will flake off from steel pipe but will adhere firmly to wrought iron. Such tests can be easily applied to wrought iron or steel pipe anywhere about the plant.

Umbrella-like Scaffold for Digesters

A FOLDING scaffold, developed by the Champion Fibre Co. of Canton, N. C., for the use of repair men while working inside digesters, was described in the February issue of National Safety News, to whom we are indebted for the use of the accompanying illustrations.

Digester repairs have often entailed ingenious handling on the part of the repair crew. It has been common practice,

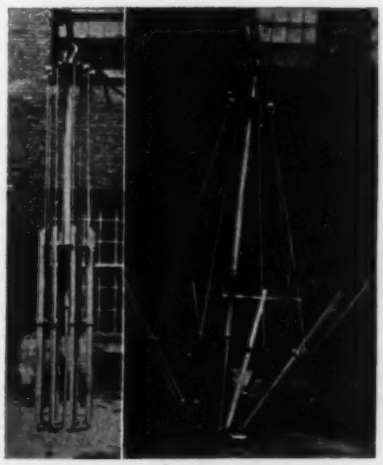


Fig. 1 *Fig. 2*

when making small repairs to a digester, to fill the digester with chips to a height sufficient to permit the repair men to stand upon them while making the repair. In case the repair job is small, this method works very well. A large job, however, necessitates suitable scaffolding within the shell if the work is to be done with the least hazard. The folding scaffold makes it unnecessary to build a scaffolding framework within the digester. When a repair job is to be done, it is simply necessary to lower the umbrella-like scaffold to a point convenient for making the repair. The scaffold, in closed position, is lowered into the digester in an inverted position. It resembles a huge umbrella with a central axis, and bows and ribs. It is supported through a rope which is attached to an eye located at the handle end of the umbrella. This rope is kept taut and stationary. Another rope is attached to a second eye. The second rope controls the outer framework. When this rope is relaxed, it allows the outer framework to open like the ribs of an umbrella and to present a working

Fig. 3

platform for the repair crew on the surface comparable to the inside surface of the umbrella. A central pipe of the framework slides over a stout rod ending in the eye to which the supporting rope for the scaffold is attached.

Figure 1 shows the scaffold in closed position. Figure 2 shows the central shaft as well as the ribs and bow. The third illustration shows the scaffold opened and the circular platform in place to support the repair crew.

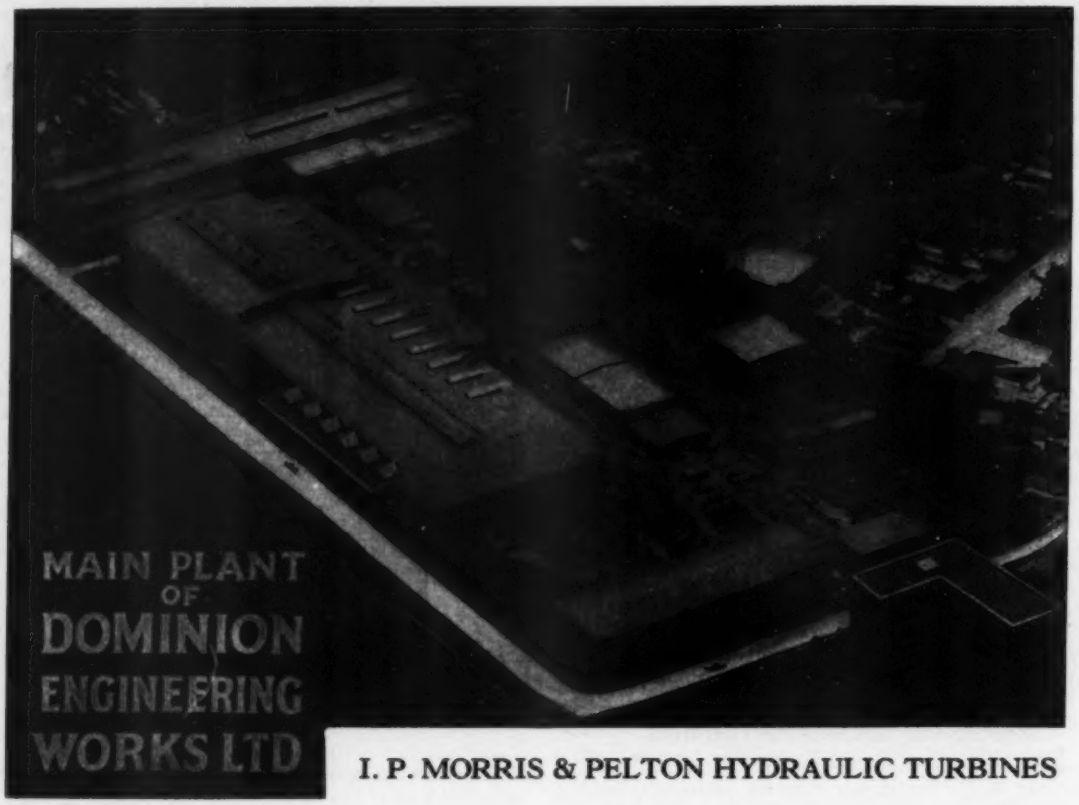
Killing Nails

NAILS left in lumber are the cause of many accidents. Dirty, rusty nails may be responsible for blood poisoning or lockjaw. Even slight wounds from such nails are apt to cause serious trouble, and in all cases should be attended to promptly. In a building program, it might actually pay to supply a hammer with a belt in which to carry it, to each of a number of employees responsible for the more menial tasks, and to impress upon these workers the responsibility of "killing" the nails. Frequently, it is profitable to sort and pile all lumber discarded in such operations, and only such lumber that is too badly broken or split to be used again should be scrapped. The rest of the lumber should be carefully sorted and piled. Nails should be removed from the sorted lumber or should be killed to eliminate in so far as possible any accident hazard. Such care should be exercised wherever lumber that has been used is being handled. Not even the removal of a few boards from a shipping container should be removed and thrown haphazardly about. Use care in the handling of all boards or timbers containing nails and it will pay big dividends.

Erratum

Under the caption "Losses Due to Waste Material" which appeared on this page in the February, 1930 issue appeared the statement, "Glass cost 40 cents per pound while scrap was worth $2.50 per hundred pounds." This statement should have read—Glass cost 40 cents per pound while scrap was worth $2.50 per ton.

The Nineteenth Annual Safety Congress will be held in Pittsburgh, Pa., September 29 to October 4, 1930. The program for the Paper and Pulp Section is now being prepared.



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Manufacturers of

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DOMINION ENGINEERING Works Limited MONTREAL CANADA

Canadian News

The Newsprint Situation

The past month has brought no new development in the newsprint price situation. Optimism and pessimism seem to alternate at rather frequent intervals. Further conferences have been held between the Premier and the executives of the paper companies; but at the conclusion a non-committal statement was issued by Premier Taschereau to the effect that "representatives of the industry had met together to discuss the outstanding problems confronting the industry at the present time and the best measures for their solution."

In the meantime, production fell off appreciably during January and showed a decline from that of January of last year, this being the first time in several years that a gain has not been shown month by month over the corresponding period of the preceding year. Operating at only 71.4 per cent of their rated capacity, Canadian mills turned out 206,305 tons of newsprint during January, as compared with 214,443 tons in January 1929. The rather surprising point about the situation was that United States mills showed an improvement over January 1929, producing 124,851 tons, as against 123,822 a year ago. This was undoubtedly due to the reopening of two mills of International Paper and a changing over of a third from bond paper to newsprint. Production in Newfoundland continues to grow, this being chiefly due to operations of International Paper there. Output was 23,263 tons as compared with 20,648 a year ago, showing an increase of 13 per cent.

Proposed Newfoundland Mill Not Assured

It would appear that all is not plain sailing in regard to the proposal to secure American interest in the establishment of a 1000-ton newsprint mill on the Gander River in Newfoundland. It was reported both in Montreal and in Newfoundland that the Hearst interests were negotiating with the Newfoundland Government in the matter, but now the news comes that the Hearst Syndicate has denied any knowledge of these negotiations. There is no doubt, however, that negotiations of some kind have been going on with some American interests, the intermediary being Joseph de Champlain, a Canadian, who has held interests in Labrador for many years.

The difficulty above mentioned, however, is not the only one. The cost of developing the necessary water power on the Gander river would be very high, owing to the geography of the region, and it would also be necessary to supplement local supplies of pulpwood with supplies from Labrador. Then again, the Newfoundland legislators are themselves split on the question, and finally the properties of the Reid estate are bound up in the matter.

Extensive Forestry Work by Federal Departments

To assist in the solution of forestry problems, the Forest Service of the Department of the Interior is carrying on research work on the national forests in the western provinces of the Dominion, and has established forest experiment stations at Chalk River, Ont., and Lake Edward, Que. Experimental areas have also been established in New Brunswick and research work is being conducted in Nova Scotia which is specially designed to assist settlers in the profitable management of their wood lots.

The Department of National Defense has ordered five Vancouver flying boats from Canadian Vickers, of Montreal, at a total figure of about $350,000. The machines will be used as replacements for obsolete flying equipment employed in forest fire suppression. The Vancouver flying boat was developed by Vickers to meet the need of the Department for a large cabin aircraft which would be capable of carrying heavy loads at high speed and of getting in and out of small lakes. It has an all-metal hull and is a biplane with a wing span of 70 feet. Its top speed is well over 100 miles an hour, while the cruising speed is just 100 miles an hour. At this speed it will carry two pilots, a mechanic and the equivalent weight of seven additional men. It is powered with two engines of 325 hp. each.

The Canadian Society of Forest Engineers recently held its twenty-second annual meeting in Ottawa. The sessions were attended by some 75 members, and during the gathering a visit was paid to the Forest Products Laboratories. Many important business questions came up at the meeting, among them several proposed amendments to the constitution. A number of important papers were also read. The report of Secretary Richardson showed a total membership of 330, of which 177 are active members. The officers elected for the coming year were: president, P. Z. Caverhill, of the Forest Branch, B. C.; vice president, J. H. White, University of Toronto; secretary, A. H. Richardson, Forestry Branch, Toronto; treasurer, Clyde Leavitt, Board of Railway Commissioners, Ottawa.

In view of the fairly extensive market for Canadian newsprint in Australia, it is interesting to learn that "The Papermakers', Limited" has been registered at Melbourne, Australia, with a nominal capital of $10,000,000 for the purpose of establishing a pulp and paper industry at Burnie, Tasmania. Twenty-two Australian newspapers have contracted to secure their paper from this concern for the next 15 years. The company is now awaiting the passing of a bill by the Federal Parliament which will provide a bounty of $20 per ton on each ton of pulp produced.

By a regrettable oversight, a credit line was omitted from the portrait of Harold Crabtree, president of the Canadian Pulp and Paper Association, reproduced on page 1961 of the February issue of THE PAPER INDUSTRY. This excellent portrait was made by the Montreal, Canada, branch of Blank & Stoller, the well-known firm of portrait photographers, New York and Chicago.

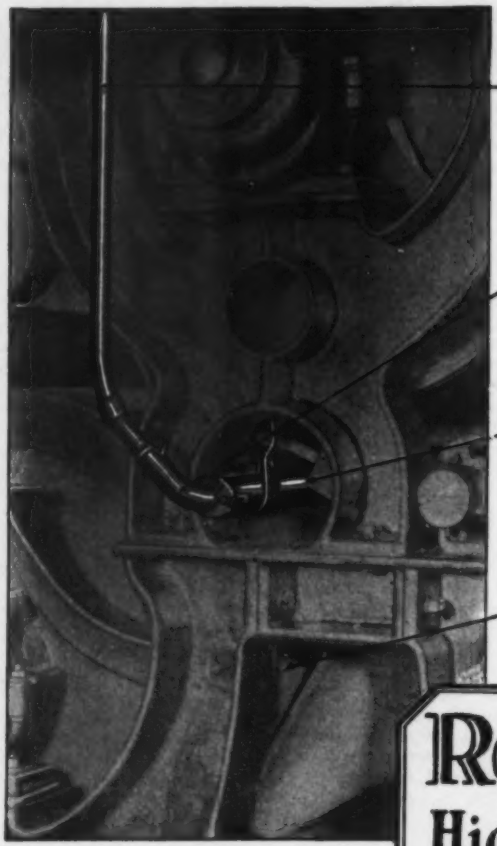
❖ QUEBEC ❖

Canadian Hydro-Electric's Developments

The year 1929 was one of continued expansion and growth for Canadian Hydro-Electric Corp., Ltd., a subsidiary of International Power and Paper Co. Additional generators were placed in operation in its hydroelectric plants, new transmission and distribution lines were completed, sub-stations were built, and a large amount of general miscellaneous construction work was carried through to completion during the year. These activities resulted in adding considerably to the installed capacity of the corporation's subsidiaries—Gatineau Power Co. and St. John River Power Co.—to meet the growing demand for electric energy, and in further unifying and coordinating the distribution facilities of Gatineau Electric Light Co., Ltd., another subsidiary of the corporation.

As a result of the work in the territory served by Gatineau Electric Light Co., electric energy is now available to a greater area and the sections previously reached by power lines have now the advantage of considerably improved service.

Generators of an aggregate capacity of 83,000 hp. were installed in the Farmers, Chelsea and Bryson hydroelectric plants of Gatineau Power Co. In the Farmers powerhouse on the Gatineau river, an additional 24,000-hp. unit raised its total installed capacity to 96,000 hp., and the 34,000-hp. generator started in the Chelsea station, a mile above



Small sized pipes that do not interfere with threading, removing of broke, etc.

Nozzles enter alternate vapor pockets from front and back of machine.

Nozzles blowing vapor away from center insuring even drying across sheet.

Vapor being blown away from dryer felts greatly increases life of felts.

ROSS-GREWIN High Pressure System

Quickly Installed

The complete installation of a Ross Grewin System can be made on your present machine during regular weekend shutdown without slightest loss of production.

This modern system effectively removes vapor by small high pressure jets of heated air blown at high velocity into alternate vapor pockets. Installations have clearly demonstrated its advantages in assuring more even drying; increased drying capacity; reduction of felt costs; minimum amount of steam and power necessary to operate; minimum space requirements.

Diagram showing general arrangement of system complete will be sent on request

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Farmers, increased its installed capacity to 136,000 hp. With the addition of these generators, Gatineau Power Co. now has 439,000 hp. installed and in operation in its four plants on the Gatineau river.

During the year, another storage dam on the upper Gatineau river was completed. The new dam, storing the waters of Lake Cabonga, and the present Mercier storage dam form reservoirs ranking with the large water storage systems of the world.

Under its three contracts with the Hydro-Electric Power Commission of Ontario, Gatineau Power is now delivering 182,000 hp., of which 150,000 hp. is being sent over a 220,000-volt transmission line 230 miles long, and is being distributed by the Commission in the Toronto area to supplement the power from Niagara Falls.

The third additional generator installed during the year in the plants of Gatineau Power Co. was in its Bryson plant, located on the Ottawa river fifty miles above the city of Ottawa. The generator has a capacity of 25,000 hp. and raises to 50,000 hp. the installed capacity of the Bryson station. With the starting of the additional generator, the aggregate installed capacity in the plants of Gatineau Power Co. was increased to 562,000 hp.

Gatineau Electric Light Co., Ltd., in 1929 carried to completion a large number of projects. New transmission and distribution lines were built throughout the various divisions of the system, the most important of which was the 13,200-volt aluminum line, thirty-two miles in length, constructed to serve Conception, Labelle and L'Annonciation.

The St. John River Power Co. during 1929 completed the installation of the second and third generators at its Grand Falls, N. B., hydroelectric plant. These generators are 20,000 hp. each and increased the installed capacity of the plant to 60,000 hp. Toward the end of the year the additional generators were tuned up to deliver power to the new Dalhousie newsprint mill of New Brunswick International Paper Co.

A transmission line connecting the Grand Falls plant and the Dalhousie mill was also completed last year. Work on clearing the 100-foot right of way was started early in March, and was practically completed by the end of June. The line is operated at 132,000 volts, and is a steel tower line 104 miles long. The standard towers in the line are 60 feet high and 606 towers were required. The spans between the towers vary from 500 to 2,000 feet, the average being 900 feet. The tower type in use on the line has only recently come into considerable favor in Canada for high-voltage lines.

Good Showing by Rolland Paper Co.

The annual report of Rolland Paper Co., Ltd., for the year 1929, shows satisfactory profits and a sound financial position. The report covers the first complete fiscal year of the present company, the previous statement having been for the seven months commencing June 1, 1928. Earnings for the year of $440,480, before depreciation, were equivalent to 3.20 times bond interest paid, and after deducting bond interest and depreciation amounted to $230,980, or 2.56 times the preferred dividend. The year's surplus after writing off proportion of organization expenses, was $130,980, which, added to previous surplus, makes the total profit and loss balance carried to the balance sheet $211,176.

In April of last year the new 86-inch fine paper machine at the St. Jerôme mill came into operation, doubling the capacity of that mill. The delay in the commencement of the operation of this machine resulted in a decline in the anticipated earnings of the company; but despite this fact the result of the year's operations is regarded as satisfactory.

Building Products Earnings Higher

The report of Building Products, Ltd., for the year 1929, reveals an increase in earnings, with net on the common equal to $3.40 per share, as compared with $2.46 in the preceding year. Net profit, after adding income from investments and deducting reserve for contingencies, amounted to $418,482, as compared with $376,395 in 1928. Deduction of preferred dividends at $6,602 and common dividends at $205,438, left a surplus for the year of $206,442. Previous surplus was brought forward at $643,465, making a profit and loss balance of $849,907 in the current report.

The organization of National Forest Products, Ltd., a joint subsidiary of Canada Power and Paper Corp. and Building Products, was completed early in the year. Insul-Board (an insulating board for building construction) a product of this subsidiary, is expected to add considerable volume to the company's sales in 1930. Solid fiber shipping cases are now being manufactured from raw material to finished case at the Portneuf mill, where Insul-Board was formerly made, and the latter is now being made in the Port Alfred mill of Canada Power and Paper.

A steam turbine which exploded in the St. Francis mill of Canada Paper Co., at Windsor Mills, caused damage to the interior of the mill and to valuable paper machinery, besides totally disrupting the local electric power supply. The total damage is estimated at several thousand dollars.

The Quebec Pulp and Paper Corp. has, during the past few months, strengthened its position by the retirement of the funded debt of its subsidiary companies and now has outstanding only $7,000,000 of the preferred stock and 100,000 shares of common, the latter being jointly owned by Price Bros. and Port Alfred Pulp and Paper Corporation, which in turn is controlled by Canada Power and Paper Corp. In addition, the company has made application to the provincial government to have the capital stock of Chicoutimi Freehold Estates, Ltd., reduced from $1,200,000 to $120,000. Operations of the company have been fairly successful during the year, though the report covering the year ended December 31, 1929, is not expected to show any material change from that of the preceding period.

Merger Details Worked Out

It is reported that the details of the merger of the Brompton, St. Lawrence and Lake St. John Pulp and Paper companies have been completed, and that only a legal technicality delays the announcement of the plans.

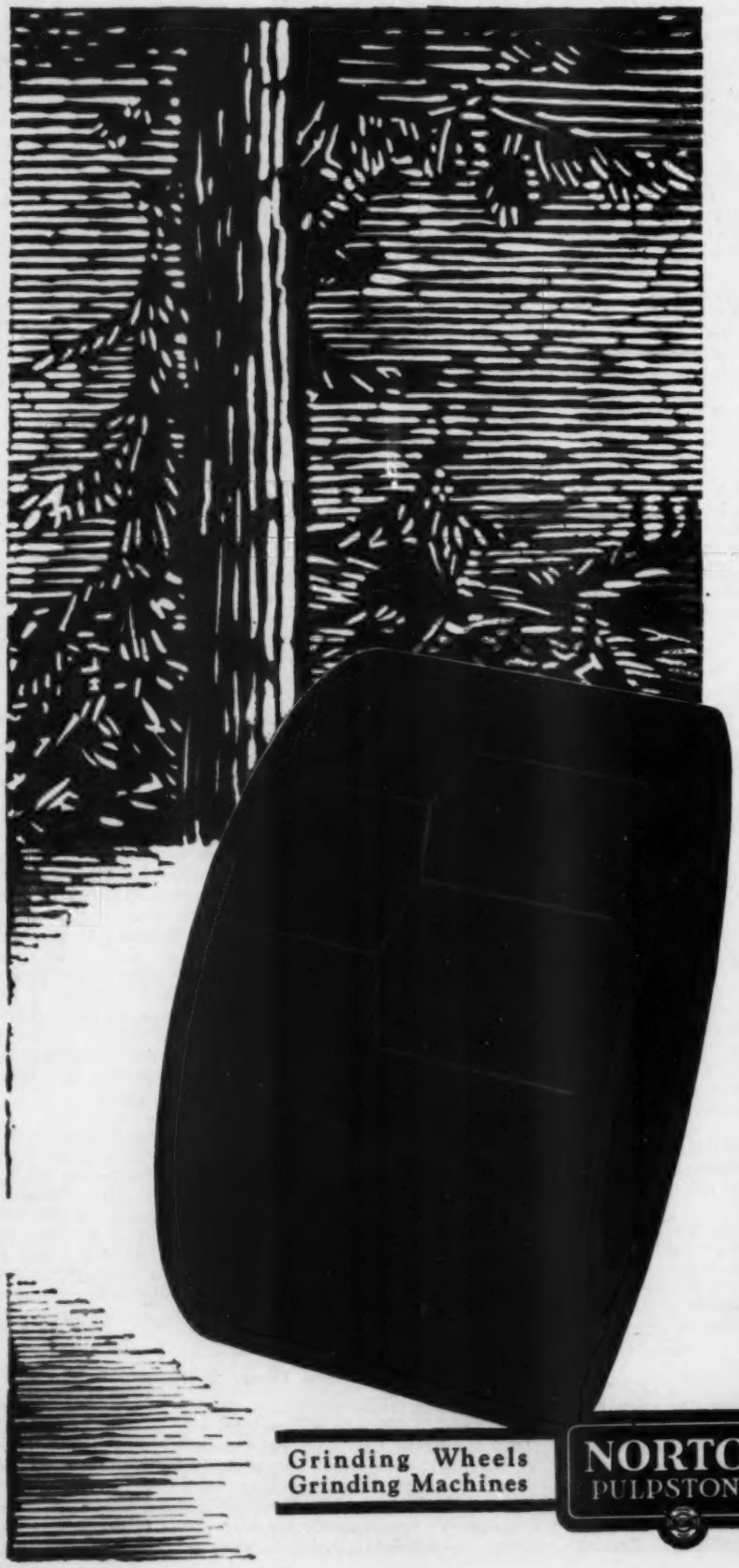
It is understood that a new holding company will form part of the arrangement and that the three companies will retain their corporate identities. Control of the common stock of the new company will, it is stated be vested in St. Lawrence Paper. Brompton is to receive share for share Class A stock carrying a dividend of $2.00 per share, of the new holding company, according to present plans. This would give Brompton shareholders the same dividend as they are now receiving.

In order that Brompton holders may benefit from any improvement which may arise in the future fortunes of the industry they will have the option of exchanging their shares for those of St. Lawrence on the basis of two of the latter for one of Brompton. It is stated that the exchange of Lake St. John will be on the basis of seven-tenths of a share of the new company for one of theirs.

The financial statement of the Duke-Price Power Co. for 1929 shows a good increase in revenue over the previous year, being up from $3,874,063 to $4,106,838. Net income available for bond interest amounts to $3,437,984; after deduction of bond interest of $2,217,104 and other interest of $325,988, there is left a balance of $894,891, from which $574,563 for depreciation was deducted, leaving a balance of $320,327 to be added to surplus, which now amounts to a total of $778,118. Net income after all charges and depreciation is equivalent to $1.54 per share on the common stock, as compared with $1.19 last year.

Canada Power and Paper in Strong Position

It has been stated on good authority that Canada Power and Paper Corp.'s report for 1929 will show bond and debenture interest and preferred dividends more than earned. It has also been pointed out that the cash and investment position of the company continues exceptionally strong. Working capital stands around the $27,000,000 mark. The corporation's investments represent power interests of great actual and potential value. It holds outright 100,000 shares



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1. Long Life
2. Low Stone Cost
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A new booklet describing these features in detail will be sent upon request.

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of Shawinigan stock, most of which was received as part consideration on the sale of its holdings of Laurentide Power stock and represent profit realized on that sale.

In addition to its huge pulp and paper interests, Canada Power and Paper has therefore a very direct interest in hydroelectric developments in the Province. It is understood that the general reserve of $13,500,000 which appeared in the December 31, 1928, statement has not since been drawn on and there also remains an undistributed profit and loss surplus from operations of over $8,500,000. In the light of a financial position so strong, it would appear that interest and dividends on the corporation's outstanding funded debt and preferred stock are protected by realized profits and operating surplus totalling over $20,000,000, represented largely by marketable assets, so that the company appears strongly fortified to meet the low newsprint prices and reduced rate of operations now prevailing in the industry. The period of the usual seasonal decline in newsprint consumption is nearing its end, and it is expected that the curve of production in the industry as a whole will shortly turn upwards.

At a recent directors' meeting of the company, C. R. Whitehead was made general manager. The other officers remain as before.

It is understood that the Dominion Engineering Works has established a new division for the manufacture of mining machinery. The company has acquired the Canadian rights for the Williamson ball mill, two of which have been completed for a leading Canadian plant. In addition, the company will undertake the manufacture of crushers, ore cars, thickeners, filters and special machinery. Up to date, Dominion Engineering Works has been specializing in the building of hydraulic and pulp and paper machinery, in which lines it has met with considerable success.

Appleford Paper Products, Ltd., has installed a factory in Montreal, where counter-check books, waxed paper for wrapping bread and other foodstuffs, parchment paper for wrapping meats, fish, etc., caps for milk bottles, printed gummed tape and other related paper products are being made. The company has had a sales organization housed in Montreal; but the volume of business in this territory has grown to such an extent as to warrant the establishment of a manufacturing plant.

In Ontario, where the tissue mills of the country are mainly located, a good deal of interest has been aroused by the report that the American Tissue Co., of Holyoke, Mass., intends to install a small converting plant in Canada, to be located in the vicinity of Montreal. It is understood that the company proposes to make certain lines of decorative crepes and waxed papers at the plant in question.

E. B. Eddy Co., Ltd., Hull, has been granted a fixed assessment of $4,000,000 for ten years by the Hull City Council. If the decision of the council is sanctioned by the legislature, tenders will be called shortly afterwards for the erection of proposed alterations and addition to plant to cost over $1,000,000. The new unit will be located at the end of Hotel de Ville St.

A New Use for Wood

Further possibilities of the commercial use of wood are dealt with in a report which G. C. Piché, chief of the Forestry Service, has made to Hon. Honoré Mercier, Minister of Lands and Forests. Mr. Piché deals with some experiments which he has been making on the manufacture of charcoal, and reports success, especially when certain hardwoods are used, and it might be well in his opinion if farmers in some sections of the province would go more heavily into this home industry, since at certain periods of the year they have time at their disposal, and their farms would be made better looking if wood debris were cleared away and turned into charcoal.

Mr. Piché also points out that Quebec Province is the first place on the continent to inaugurate a system of township forestry reserves, and he is of the opinion that they are indispensable to the farmers and to the little industries which exist in the rural centers. From the results already achieved in the short time since this system was inaugurated, Mr. Piché figures that before very long it will be possible to cut 50,000,000 board feet a year from these reserves without in any way impoverishing the lands, which before being taken over were practically unproductive.

New Type Recovery Furnace for La Tuque Mill

A large expansion and modernization program is being inaugurated by the Brown Co., manufacturer of pulp, paper and chemicals. Dr. Hugh K. Moore, chief chemist of the company, recently returned to Berlin, N. H., from La Tuque, Que., to be on hand for the installation of an evaporating plant which, when finished, will be the largest and most efficient in the world.

He has started the operation of a new type of smelting furnace, for recovering chemicals used in the manufacture of the special products of the Brown Co. The recovery of these chemicals and of the heat contained therein has been a problem which has perplexed Dr. Moore for the last 15 years, and its successful solution is particularly pleasing to him. The erection of other furnaces of like design will follow both at La Tuque and at Berlin.

Rapid Progress on McLaren Project

Work on the 250-ton newsprint mill being constructed at Masson, near Buckingham by the McLaren interests has progressed to the point where the newsprint mill building has been completed and in readiness for the machinery.

The hydroelectric development will be fed from a dam at Cedar Rapids on the Lièvre river. Waters in White Fish lake and the river down as far as the Wabasee Rapid will be included in the new storage. The power house will be at High Falls, some 30 miles from Buckingham, where there is a fall of approximately 120 feet. It is expected to develop some 90,000 horsepower. Considerable work has already been done on this project.

Upon application of bondholders and under date of February 11, 1930, G. T. Clarkson, Toronto, was appointed receiver and manager of Canadian Paperboard Co., Ltd., while at the same time an application was made for the appointment of an interim receiver under the Bankruptcy Act. The receiver and manager stated that it was desired to make clear to customers, bondholders and creditors that such proceedings were taken not for the purpose of liquidating the affairs of the company, but in order to permit a reorganization of its financial structure and, with such the case, it is contemplated that business of the company will be continued without interruption.

◆ ONTARIO ◆

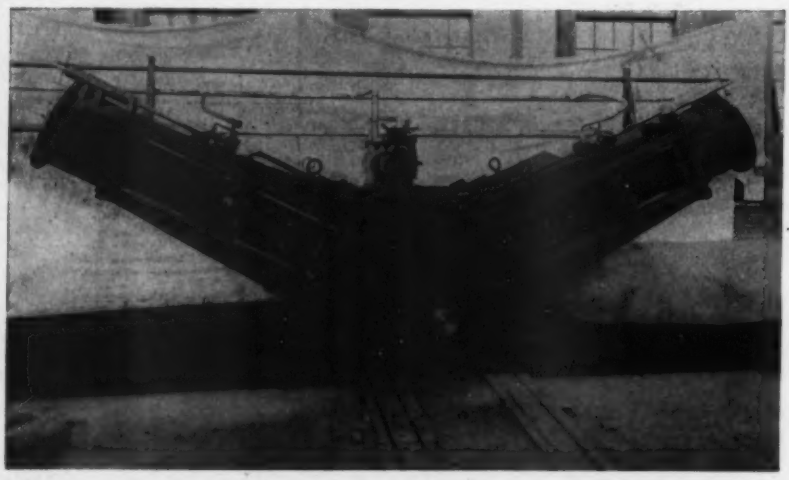
Provincial Paper Year Satisfactory

Manufacturing profit of Provincial Paper, Ltd., for 1929, at $1,109,249, is slightly below the 1928 figure of $1,138,331, while sundry revenue increased from $1,889 to $26,839. A saving has also been made in interest charges by reduction of a portion of bond indebtedness through sinking fund. From the profits for the year there was deducted $250,000 for depreciation, $10,000 for doubtful accounts and $40,000 for income tax. Depreciation this year compares with $450,000 set aside in 1928.

After all charges there remained for bond interest $836,087, which is 3.28 times interest requirements of $251,619. Preferred dividend requirements of $245,000 were covered 2.39 times. The balance of $339,468 was carried to surplus, increasing this amount to $526,243. Profit on common stock now held by Abitibi was equal to $3.39 per share. The ratio of current assets to current liabilities is over 5 to 1 and net working capital amounts to $2,132,422. Unfilled orders on hand at the first of February were slightly in excess of those for the same period last year.

Efficient Machinery
for
Higher Quality and Lower Costs

The days of plugging along with old, narrow, slow-running paper machines have passed and the paper and pulp makers must now extend this policy of high speed production into all departments of their mills.



"Speed Up Production, Improve Quality, Cut Down Costs," is the slogan that is ringing through all industries as a result of competitive conditions the like of which never before existed in this country.

We have machines which will help you to completely exemplify the aforementioned slogan and we solicit your business, knowing from experience what these machines will do.

Above:

KAMYR CONTINUOUS GRINDER

(PATENT)

Low first and maintenance cost. Very large production. Continuous Hydraulic Grinder with highest efficiency. No extra heavy foundation required.

Right:

KAMYR WET MACHINE

(PATENT)

Up to 100 air dry tons Sulphite or Sulphate or 50 tons groundwood per day produced, 50-60% air dry. Enormous savings in labour, wires, felts, upkeep, floor space, steam, power, etc.

WE ALSO HANDLE:

K. M. B. SLAB CHIPPER

Makes saw mill and box factory waste into good quality chips for pulp at low cost.

K. M. W. ROUND WOOD CHIPPER

Characterized by making chips of very even quality with very small loss of sawdust and inferior chips. Low speed, low power consumption, high production.

G. D. JENSSEN CO.

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For Paper Machinery Ltd., Montreal

As indicative of the strong financial position and conservative policy of the company, the sinking fund requirements on its bond issue, which commenced in 1929, and amounting to $125,000 annually, have been met by the surrender and cancellation of $380,000 of the company's bonds. In addition, the company has purchased and holds in its investment account $425,000 of its own bonds, thus anticipating its sinking fund requirements until 1934.

Earnings of the F. N. Burt Co., Ltd., for the year 1929, aggregated $4.65 a share, against $4.72 in 1928 and $4.60 in 1927. Profit from operations at $785,288 compares with $789,843 in the previous year. A sum of $195,628 was provided for depreciation, $25,725 for amortization of patents and $61,000 for taxes, leaving $503,535 available for dividends. The selling prices of the company's products averaged lower in 1929, but the effect of this tendency was offset by increased volume and lower manufacturing costs. The shareholders unanimously approved the transfer of the Canadian sales book and form department to Moore Corp., Ltd., in exchange for a stock interest in that company.

Preferred Dividend Earned by Good Margin

Though the annual report of Abitibi Power and Paper is not yet ready for publication, it is learned that the past year has been a very satisfactory one so far as operations are concerned. It is reported that the preferred dividend has been earned between one and a half and two times, which would indicate somewhere around $10 or $11 a share on the preferred stock, of which 348,818 shares are outstanding, an amount equivalent to between $3,500,000 and $3,800,000. As the common stock comes immediately after this, it follows that a substantial sum will be shown as available for the junior security. The 1929 statement, it is said, will show a considerable increase in earnings over that of 1928, and in addition will indicate a very strong working capital position.

The continuance of the News Print Institute of Canada will assure for Abitibi this year its share of the tonnage available for Canadian mills, and unless there is an unexpected decline in business in the United States, and therefore in the demand for newsprint, there appears every reason to expect that Abitibi will do at least as well in 1930 as it did in 1929.

The annual report of the Corrugated Paper Box Co., Ltd., Toronto, for the past year shows that a large increase in production and sales featured the business. Savings in operations have been effected through increased production and convenient manufacturing facilities available at the new plant at Leaside. It is not expected that the net profits will reflect this wider business, as the close price situation for part of the year cut the profits of all competing companies. The difficulties surrounding the price situation are reported to have been largely overcome and with increased sales and new plant, the management is looking forward to 1930 as a year in which profits should show a substantial increase.

With roofing partly finished and plastering started, additional contracts have been let in connection with the building of the new plant at Peterboro of the Robert Martin Corrugated Paper Box Co.

❖ BRITISH COLUMBIA ❖

Sale of Whalen Company Maintained

Chief Justice Morrison recently dismissed in the Supreme Court of British Columbia an action brought to set aside the sale of the assets of the Whalen Pulp and Paper Mills for nearly $4,000,000 on October 25, 1925 to the Royal Securities Corp., Ltd., of Montreal. The action was dismissed at the consent of the plaintiffs' counsel, who said he had no evidence to go on with the case. James Whalen of Port Arthur, one of the plaintiffs, died several months ago. The remaining plaintiffs were George F. Whalen, Vancouver, and Mrs. Verna Dangerfield, of New Westminster, who sued on behalf of themselves and other debenture holders of the Whalen Pulp and Paper Mills, Ltd.

The plaintiffs estimated the holdings of the company in the neighborhood of $10,000,000 to $15,000,000, whereas the holdings were sold to meet the first mortgage bonds on which $3,707,500 was in default. The defendants included the Montreal Trust Co., Royal Securities Corp., British Columbia Pulp and Paper Co., Ltd., of Vancouver; I. W. Killam of Montreal, president of the Royal Securities Corp., and the Whalen Pulp and Paper Mills. The assets of the Whalen Co. were sold to the Royal Securities Corp. under an order of the court. The British Columbia Pulp and Paper Co. took over the undertakings, and Mr. Killam was president. The Montreal Trust Co. was trustee of the debentures.

Dr. D. F. Brooks

Dr. D. F. Brooks died recently in California after a month's illness, at the age of 80 years. He was president and founder of the Powell River Co., Powell river, having turned from medicine to industry and commerce, making a great success of his ventures. Dr. Brooks, who is survived by three sons, a few weeks ago visited the company's mills to inspect the preliminary operations in connection with the construction of additions to the company's equipment which will cost approximately $8,000,000. From Vancouver he proceeded south with the intention of remaining in California for the winter months, and was taken ill. Although the Powell river development was the largest single enterprise Dr. Brooks accomplished, he was interested in large lumber concerns on the Pacific coast, in Florida and in the Bahama Islands.

In addition to his Powell river holdings, Dr. Brooks was a leading shareholder and executive member of the following organizations: Brooks-Scanlon Co., Foley, Fla.; Brooks-Scanlon Lumber Co., Bend, Ore., and Minneapolis; Bahamas-Cuban Co., Bahama Islands, and the Minnesota Transfer Co.

Work on the new plant of the Powell River Co. is now well under way. Already 25,000 cubic yards of earth have been excavated from the site of the new machine room. This excavation is used to reclaim land along the waterfront, and thus make available ground which may be utilized for further extensions. Boring of both the north and south portals of the Lois river tunnel is now commencing, and once the workers overcome the weather conditions and get inside the shelter of the rock, it will be possible to continue boring right through the winter. The construction camp of the Stuart Cameron Co., general contractors for the project, has been completed. It provides accommodation for 300 men, which, it is estimated, will be all that is required on the job for sometime at least.

Paper Converting Plant for Vancouver

A plant to manufacture paper specialties will be erected in Vancouver by Pacific Mills, Ltd., as a unit of their Ocean Falls paper mills, on a site between the wharves of the British Columbia Sugar Refining Co. and the Kingsley Navigation Co., at the foot of Campbell Ave. The property has been leased from the Harbor Commissioners for twenty-one years.

Announcing the completion of negotiations with the harbor commissioners F. N. Youngman, general manager of the company, stated the plant would represent an investment of between $100,000 and $150,000. The factory will employ close to 100 men. It is expected that production will have commenced at this new plant by May 1st. The plant will convert Ocean Falls paper into waxed coverings, wrappers, fruit papers for the Okanagan apple crop, towels, napkins, and a score of other specialties. The plant will be two stories high, measuring 260 by 120 feet. The lower floor will be used for the factory and the upper floor for the city offices of the company, which are now located in the Standard Bank building.

The processes of the factory will convert 6,000 tons of paper annually. Part of the machinery for this will be

You Buy Your Letterhead Once A Year — You Use It Every Day!

EVERY day... many times a day... your letterhead ventures forth into the world ..as a representative of YOU.

But IS it representative of you? DOES it express your organization? DOES it convey the correct impression?

You will find in Adirondack Bond a paper that DOES convey the right impression. It is a good bond paper at a moderate price. It satisfies the eye and the thumb. Being tub sized, it offers an excellent printing surface — a surface that won't rough up even under the eraser. It comes in white and eight colors. Ask your printer to show you samples of Adirondack Bond.

Adirondack Bond is ideal for office forms and records. Comparative grades are Adirondack Ledger and Adirondack Bulletin.

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brought from Ocean Falls, where the company has previously operated a small conversion plant. New machinery and construction of the plant will bring the total expenditure of the company in Vancouver to close to $150,000.

Production of newsprint and groundwood at Ocean Falls was stopped for sometime last month, putting over 100 men temporarily out of work, when the big steel penstock which feeds water to the turbines broke. The work of repairing the break was pushed as fast as possible, so that work was resumed in a fairly short time. Production at the kraft and sulphite mills was not interfered with as a result of the accident.

❖ NEW BRUNSWICK ❖

Fraser Companies Show Deficit

The annual report of Fraser Companies, Ltd., which has just been issued, shows a considerable decline in earnings for the year ended December 31, 1929, as compared with the previous year, and the unfavorable showing is accentuated by deduction of heavier interest charges. The operating profit for 1929 was $1,419,961 as compared with $1,765,154 in 1928. Interest charges against the 1929 figure were $1,391,996 as against a comparative 1928 figure of $837,355. The 1928 net income of $434,633 compares with a deficit of $711,097 in the latest report. After the payment of dividends totalling $301,048 the report shows a net deficit of $1,012,145. With the surplus of $1,950,046 from the previous year, the profit and loss balance is carried forward at $937,901. Working capital shows excess of current assets over current liabilities at $4,225,593. The 1928 working capital figure was $5,656,751. Total assets of $52,340,350 compare with $40,383,538 in 1928.

In giving reasons for the decreased earnings during the past year, President Archibald Fraser says: "It was not found possible to bring the full equipment at the Madawaska mill into full operation as rapidly as anticipated. As a result of this and largely reduced profits from the operation of the lumber department, earnings for the year have been adversely affected. In addition, extensions to plant resulted in largely increased interest charges, though a part only of the added plant capacity became productive during the past year."

In the course of last year plant expansion at Edmundston was completed. An additional 55-ton per day catalogue paper machine was added to the Madawaska mill, coming into operation on January 1, 1930. A bleached sulphite pulp mill of a daily capacity of 150 tons has been under construction at Athol by the Restigouche Co., a wholly-owned subsidiary, and should be in operation by the end of March. The installation of the second catalogue machine at Madawaska properly balances the groundwood and catalogue paper departments and utilizes electrical power previously unused and being paid for under contract. The company's total daily output for sale now amounts to 460 tons, which will be raised to 610 tons with the completion of the Athol mill. In addition, the company has a large output of lumber and miscellaneous products. The output of the two catalogue paper machines is said to be fully sold.

Raymond Hagadorn, for the past two years assistant superintendent of the Fort Edward plant of International Paper Co., has resigned his position to accept a similar post with the Fraser Companies at Madawaska, Me., and has already assumed the duties of his new position.

International Paper Activities

Owing to operating difficulties in connection with a serious freeze-up of the water supply line from the Charlo river, the formal opening of New Brunswick International Paper Co.'s newsprint mill at Dalhousie has been postponed from February 14 to March 14.

A. N. Russell, consulting engineer for Dominion Engineering Works, Montreal, and William L. Tonkin, erection superintendent for the same firm, were in Dalhousie recently completing an inspection of the 226-inch high speed paper machines supplied to the Dalhousie mill and found these machines functioning in a satisfactory manner under the temporary steam tests.

The Foundation Co., Ltd., of Montreal, is fulfilling a contract for a new dock at Dalhousie. The old pier there is also being reconstructed, with new sticks and reinforced concrete. In order to allow the docking of large freighters, considerable dredging will be done in the river up to the mill. When this work is completed the company will have ample facilities for shipping its paper and receiving its supplies by water.

Surveys have been made at L'Anse aux Cousins and Gaspé Harbor, preparatory to the erection of a new pulpwood handling plant at either place for International Paper Co. The surveys are being made by J. U. March and R. P. Freeman of the engineering staff of International Paper at Dalhousie. The two engineers are spending the winter on the surveys, having been transferred to that work. Although no choice has yet been made between L'Anse aux Cousins and Gaspé Harbor, indications are that the first named location will be selected because of the storage space available for pulpwood on lands formerly owned by Shepard and Morse, Boston lumber dealers, and which have been acquired by the International interests.

❖ ENGLAND ❖

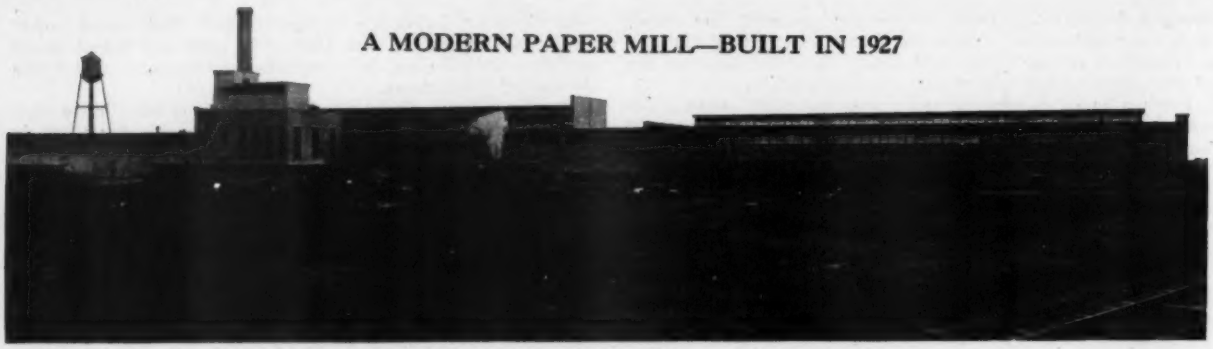
Papermakers Merge Interests

The tendency towards combination in the paper industry is emphasized by the recent announcement regarding closer working between Wiggins, Teape & Co., and Portals (John Allen & Co.). The last mentioned company is engaged in the manufacture of bank note and paper and special paper products for domestic and foreign official and government use, and was a close competitor of Wiggins, Teape & Co., a company making similar classes of paper. Both firms have expanded and developed since the war, and between them supply the greater part of the needs of users of fine papers including practically every grade of high class business paper.

Portals have taken over several mills since the war, and Wiggins, Teape have joined forces with an old established Aberdeen house—Alex, Pirie & Sons, and with other companies. Each firm is making use of the chain depot system for direct and spot service, and there has been a close similarity in their methods and growth. They both make and merchant their own products, and an equal effort has been expended in fostering overseas markets with a result that the combined firms have a solid overseas market. Foreign representation is in the hands of a highly skilled body of agents, who between them cover the greater part of the globe.

One expert in the trade says that this example of co-operation represents a movement of a kind which is to be regarded as a model not merely for the papermaking industry in particular, but for British industry in general, for it indicates rationalization in its fullest sense. It has been pointed out in this connection that a steady evolution has been taking place in the paper industry during the last ten years. Before that time the small mill served the merchant and the merchant ruled the market. There were the larger concerns, of course, doing their own manufacture and distribution of both paper and manufactured stationery, and combination of interests began with the amalgamation of certain of these larger concerns. Coincidently, merchants sought to better their position by, in some cases, securing financial interest in, and in other cases obtaining control of, mills with which their business relations were strong. Prominent firms in the trade pursued a policy of taking over the smaller mills. In another direction there was grouping under financial control. Not all of these methods have been successful. To a large extent paper distribution has been left to settle itself and the solution of this problem has become infinitely more difficult. It is not clear yet, as a general principle whether the papermaker is a servant of the merchant or vice versa.

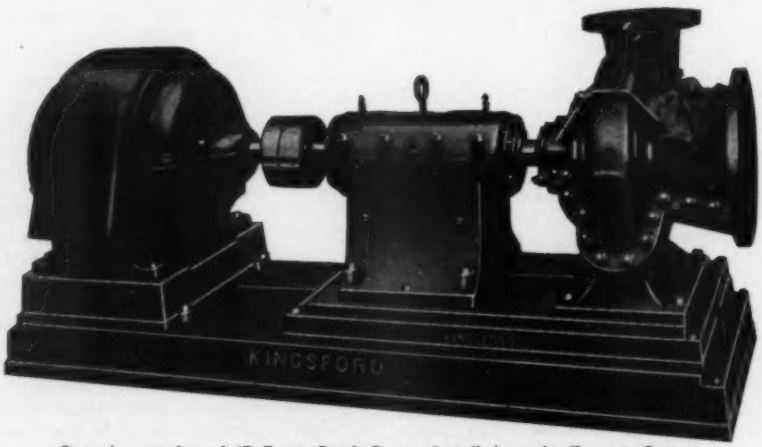
A MODERN PAPER MILL—BUILT IN 1927



PLANT OF TAGGART OSWEGO PAPER AND BAG CORPORATION

Absolute confidence has been exhibited by the Taggart Oswego Paper and Bag Corporation, Oswego, New York, in providing for the most part, centrifugal pumps for their fresh water supply, the handling of white water, stock, boiler feed and process requirements, and such installation for these purposes of—

KINGSFORD PUMPS



One of a number of 8" Paper Stock Pumps installed at the Taggart Oswego Paper & Bag Corp., Oswego, N. Y.

All KINGSFORD double suction pumps up to 10" size are made with bearing housings cast integral with the lower half of casing (machined as a unit with casing), insuring absolute and permanent alignment of bearings. Horizontal split casing provides quick accessibility to interior. Sealed bearings can be furnished in either babbitted, ball or Timken roller types. KINGSFORD patented hydraulic balancing device eliminates end thrust.

KINGSFORD multi-stage centrifugal pumps have the same construction features as listed above, same type and construction of bearings, and with either ball thrust bearing or KINGSFORD patented double acting hydraulic balancing piston.

The desirability of these features appeals to Paper Mill Operators and all of them will only be found in KINGSFORD line of pumps.

Write for further information—our 30 years of experience may be of value and profit to you.

Kingsford Foundry and Machine Works

Una-Flow Engines all Types
High Speed, Vertical,
Horizontal and Marine.
Centrifugal Pumping Machinery

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Internally Fired Boilers
for
Marine and Stationary Purposes
Sectional Water Tube Boilers

Some mills are unable to adopt methods of publicity or to secure the selling advantage of branding because of the conditions which govern the relationships with the merchanting trade. For this and several similar reasons the papermaking industry does not exhibit any organized procedure. The present amalgamation indicates the way to economic efficiency in the paper industry.

Research Specialist Addresses Technical Section

At a recent meeting of the London Division of the Technical Section of the Paper Makers' Association, W. Raitt read an extremely interesting paper on the childhood of papermaking. Mr. Raitt is well-known in connection with his researches into the use of bamboo as a suitable material for papermaking and has spent many years in India and Burma as head of the Government Forest Research Department.

It was in Kashmir which he first visited in 1917 that he was able to trace the early beginnings of papermaking. The introduction of it into that country is ascribed to Zain-ul-Abidin, the Parsian who ruled Kashmir from 1420 to 1470 A. D. He brought papermakers from Samarkand and established them with grants of land. They brought with them the two great contributions of the Parsians to the art, it is not too much to say two of the foundation stones on which we are still building; to wit, the transfer suction mould and the mechanical powered rag beater, and there they have remained to the present day like flies embalmed in amber, unaltered, unimproved, but also undegenerated.

Mr. Raitt said that he had never yet heard a definition of what paper is in concise and yet comprehensive terms such as we applied to other manufactured articles. The best he knew described paper as an aqueous deposit of vegetable fiber. This describes paper as we now know it, and definitely excludes papyrus, which has an antiquity far greater, but which although used for similar purposes is not paper any more than parchment is. The discovery or invention of paper is on good authority ascribed to the Chinese at a date about two thousand two hundred years ago, and for a thousand years the art was hidden. The Arabs who in 751 A. D. were in possession of Samarkand were attacked by the Chinese from what was the province of Chinese Turkestan. The attack was repulsed and among the prisoners taken from the Chinese by the Arabs were certainly papermakers. Thus came the art to Samarkand and hence westward to Europe through the Arabs and Moors and southward to Kashmir through the Persians.

The printing and paper trades have for several years been waging an uphill fight for standardization. One member of the trade now asks, "Why not carry the war into the camp of the manufacturing stationer? The amount of unnecessary difficulties placed in the way of the printer who wishes to meet the requirements of his customer is immediately apparent from a study of the manufacturer's catalogue. In one manufacturer's catalogue alone there are 518 different kinds and sizes of envelopes between the sizes of 4½ and 3¾ inches and 14 by 12 inches. To enable a manufacturer to supply one hundred envelopes of a certain kind at a given moment he needs a stock of 10,000 envelopes.

At a meeting of the employees of the firm of Hollingworth & Co., papermakers of Turkey Mill, Maidstone, General Pitt who presided, said that it looked very much as if the government in the forthcoming budget were going to remove the safeguarding clauses from those trades that had already worked hard to get them, and had benefited very much from these clauses. A part of the papermaking trade had been protected and it had benefited so much that new machines had been put down and that of course meant more employment.

Tasmania Project Progressing

An Australian correspondent of The Times reports that the establishment of a wood pulp and paper manufacturing industry in Tasmania has been advanced another stage. Detailed plans for the work are expected from England very soon. A bounty of $20 has been publicly promised by the Federal Government. The parties interested are acting on the advice of Mr. William Adamson, technical adviser to leading British and Canadian papermakers, who has expert and intimate knowledge of papermaking in all parts of the world. Mr. Adamson visited Australia in 1925, and again several months ago, and after closely investigating the position from the producing and marketing standpoint, he has strongly recommended the immediate establishment of the industry. His opinion is that pulp from Australian hardwoods is admirably suited for manufacturing of all kinds of printing and writing papers.

Mr. Adamson, the Times correspondent continues, has recommended a scheme under which the building of the works will proceed in three stages, and the three stages should be completed in less than three years from the outset. The production forecast for the three sections is approximately 75,000 tons a year.

Mead Interests to Consolidate

The Mead Corporation has been incorporated under the laws of the State of Ohio to acquire the outstanding stocks of The Mead Pulp & Paper Company (which owns The Mead Fibre Company and The Mead Straw Pulp Company), Mead Paperboard Corporation and The Management, Engineering & Development Company. All of the foregoing companies, except Mead Paperboard Corporation, a Delaware corporation, are incorporated under the laws of Ohio.

The Mead Pulp & Paper Company plants are located at Chillicothe, Ohio and Kingsport, Tenn., its Dayton plant having been recently moved to Chillicothe. This company manufactures chemical pulp and standard magazine, book and coated papers. The plants have a present combined capacity of 360 tons daily of finished papers, practically all of which is supplied under contract to publishers.

Mead Paperboard Corporation is a holding company, with five subsidiary manufacturing companies owning and operating eight plants now making tannic acid, which companies constitute the largest single group in the world manufacturing tanning materials. The plants are located at Lynchburg, Radford, Damascus and Waynesboro, Virginia; Newport, Knoxville and Harriman, Tenn.; and Sylva, N. C. Pulp and paper mills for the manufacture of corrugated and liner board, with a present daily combined capacity of 325 tons, have been added to four of these plants during the last two years. These products are used in the manufacture of corrugated paper boxes.

The Management, Engineering and Development Company, located in Dayton, Ohio, is an operating company with a trained technical organization for the engineering and development of pulp and paper processes and plants, and their management. Its capital structure consists of 10,000 shares of no par value.

It is proposed that The Mead Corporation will exchange its stock for the outstanding stock of The Mead Pulp & Paper Company, the Mead Paperboard Corporation and The Management, Engineering & Development Company on the following basis:

A—One and one-fifth shares of $6 cumulative preferred stock, series A, for each share of 6 per cent preferred stock of The Mead Pulp & Paper Company.

B—One and one-sixth shares of $6 cumulative preferred stock, series A, for each share of 7 per cent special preferred stock of The Mead Pulp & Paper Company.

C—Two shares of common stock for each share of common stock of The Mead Pulp & Paper Company.

D—Two and one-half shares of common stock for each share of 7 per cent preferred stock of the Mead Paperboard Corporation.

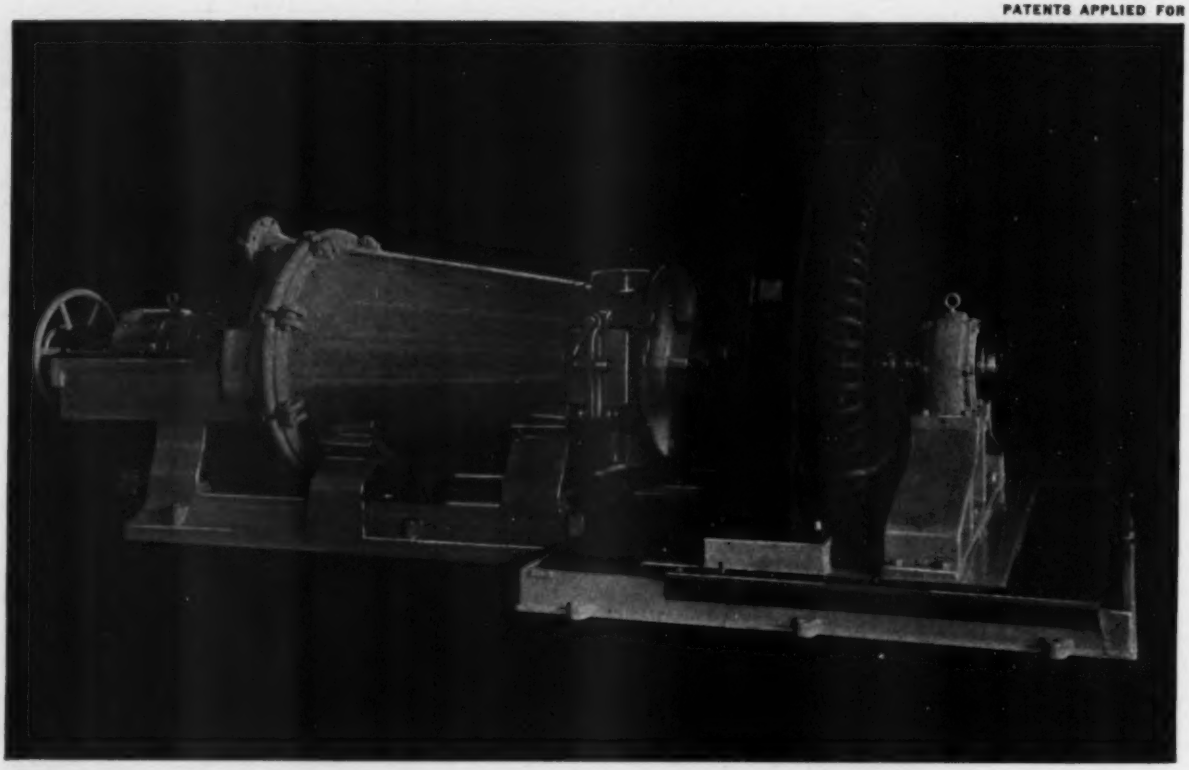
E—One share of common stock for each share of common stock of Mead Paperboard Corporation.

F—One share of common stock for each share of the stock of The Management Engineering & Development Company.

Assuming that all stockholders of the participating companies accept the terms of exchange as set forth above, the outstanding capitalization of The Mead Corporation will be: 38,250 shares of $6 cumulative preferred stock, series A; 435,000 shares of common stock.

AN IMPORTANT ADVANCEMENT IN JORDAN CONSTRUCTION BECAUSE IT BRINGS SUPERIOR JORDAN PERFORMANCE

PATENTS APPLIED FOR



.THE APPLETON CLOSE-COUPLED JORDAN ENGINE

On the job the Appleton Close-Coupled Jordan is convincingly demonstrating that it is a Jordan of superior performance. It is an advanced Jordan offering advantages attainable only with this new development in Jordan construction, a decided increase in operating efficiency, satisfying economy and unfailing dependability. The motor direct connected to the shaft means a more efficient, profitable power application. The flexible coupling is eliminated. Accurate control and uniform stock refinement are important features. SKF bearings guarantee better bearing service and greater bearing satisfaction. To assure the permanence of the greater operating efficiency of the Appleton Close-Coupled Jordan it is remarkably rigid and compact (it takes up about a quarter less floor space) two factors which are of vital importance in durability and dependability. The Appleton Close-Coupled Jordan is an outstanding value in Jordan satisfaction because it offers outstanding Jordan performance . .

THE APPLETON MACHINE COMPANY . . APPLETON, WISCONSIN

The Appleton Open-Throat Jordan Plug is standard equipment with the Appleton Close-Coupled Jordan

The Month at Washington

CONGRESS—Plans to expedite postal legislation are being made by the House Committee on Post Offices and Post Roads, which has already reported five bills favorably and which have been placed upon the unanimous consent calendar and are scheduled to come up for consideration by the House shortly, including (H.R.1234) a bill authorizing the Postmaster General to collect demurrage charges on undelivered collect-on-delivery parcels, (H.R.5659) providing for charges on inquiries concerning registered, insured collect on delivery mail and postal money orders; H.R. 7395 to extend to government post cards the provision for defacing stamps on government stamped envelopes by mailers; H. R. 8569 providing extra receipts on certificates of mailing for other than ordinary mail; H.R. 8650 providing for charges for extra services in postal service such as the disposition of undelivered mail:

A bill still before the committee is one providing for a special directory service charge on misdirected mail. The Watres bill (H.R. 9500), sponsored by the Postmaster General, which is designed to promote aeronautics in this country, is also still in Committee.

A bill introduced in the House recently (H.R.9409) would repeal the club dues tax section of the 1928 revenue act.

H.R. 9445 would prohibit the sending through interstate commerce of unsolicited goods, wares or merchandise, either by mail, express or other common carrier, for the purpose of sale, and providing a penalty therefor.

H.R. 9447 would create a Negro Industrial Commission, whose duty it shall be to study the economic conditions of the negro, labor problems, to promote the general welfare of the negro in industrial pursuits, to investigate all labor questions referred by the governor of any state, to recommend necessary regulations for labor conditions for the best interest of the communities in which labor questions arise; to recommend what is necessary to stabilize labor in different states; to discourage Bolshevism; to formulate policy of mutual understanding between the races, etc.

H.R. 9635 would create a World Commerce Corporation and provide for the establishment, operation, and maintenance of foreign trade zones in ports of entry of the United States. This corporation is to be set up to serve the industries of the United States by establishing a clearing house for commerce, through which a world-wide distribution of products can be made; erecting and operating shipping bases, with fuel stations and store houses; controlling reserves of natural resources which will supply ships with return cargoes and stabilize prices of raw materials which U. S. industries must obtain abroad; organizing selling and purchasing agencies in foreign cities and countries of the world; furnishing loans and credits through banks or directly to corporations, firms, individuals, etc.

H.R. 9769 would protect interstate and foreign commerce against bribery and other corrupt trade practices, by making it unlawful for any corporation, partnership or firm to give or offer to give any employee, representative or agent directly or indirectly any commission, money or property as an inducement, bribe, or reward for doing or omitting to do any act or for showing or forebearing to show any favor or disfavor in relation to the affairs or business of his employer or principal, and making it impossible for any employee or agent to solicit, accept, receive or take directly or indirectly any commission, money or property, or showing any favor or disfavor in relation to the affairs or business of his employer or principal.

Congressman Kincheloe introduced a bill to amend the trade-mark law (H.R.10251) allowing any person who has adopted a trade-mark to immediately apply for registration.

Congressman Haugen introduced a bill authorizing the Government to accept a donation of land and to construct suitable buildings for the Forest Products Laboratory (H.R. 9900).

The Vestal trade-mark bill (H.R.2828) has been reported favorably out of the Committee on Patents and is now on the house calendar for action. The purpose of the bill is to incorporate into one act the various federal trade-mark acts, also to simplify proceedings and remove technical obstructions.

The committee is still holding hearings on the Vestal bill (H.R.7243) to provide copyright registration for designs and styles.

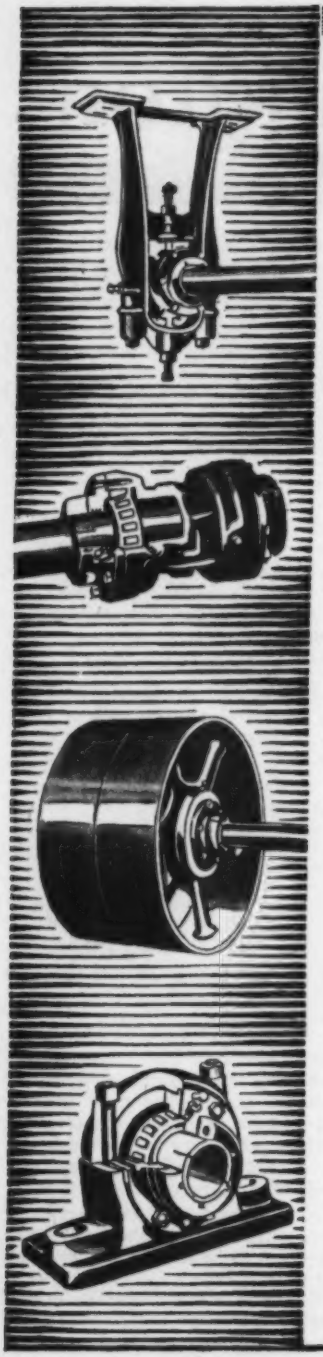
Treasury Department officials are drafting a bill which seeks relief from double taxation, as a result of a conference held recently with a group of business leaders when a tentative program for relief was outlined. It is pointed out that there can be no deviation from the policy of taxing, roughly, business income where the permanent establishment is in the United States, income from personal services performed in the U. S. and income from rents, royalties or sales of real property in the U. S., but other income can be taxed in the country where the recipient resides and this is hoped to be accomplished through the establishment of reciprocal relations. International trade must be encouraged and the move to eliminate the burden of having income from that trade taxed in more than one jurisdiction must be pushed forward by the American Government, was the consensus of opinion. The movement to eliminate double taxation is gaining headway in a majority of the larger nations, it is pointed out.

Congressman Jones of Texas introduced a bill in the House (H.R.10122) to permit the regulation of monopolies, trusts, chain stores, combinations and holding companies and which would make them subject to state laws even though engaged in interstate commerce.

Study of Obsolete Machinery—The Department of Commerce has begun its study of obsolete machinery to assist manufacturers in working out a scientific machinery replacement policy. The study is designed to determine in individual instances whether manufacturers are producing at greater cost than necessary on account of the retention of inadequate equipment, and to explore the possibilities in individual industries of reducing costs through substituting new machinery for relatively obsolete machinery.

A study has been made in Philadelphia of one particular industry, the results of which will shortly be published. Another type of industry is now going to be studied in Cleveland, to ascertain the number and type of machines in use in each plant, whether they are hand or power machinery, their production and efficiency records, their age, whether they were bought new or second hand, whether they have been rebuilt, whether attachments were added, and the type of the product, in order to obtain a picture of the profitable life of producing machinery. The number of idle machines is also being studied.

Retail Credit Data—Retail credit data is now to be obtained semi-annually by the Department of Commerce, and after July next a current check will be available on the trend in consumer buying and retail credit, and will disclose existing credit practices and their results. Questionnaires are now being prepared and broadcast to the trade which ask for information concerning the percentage of business done on credit basis, the promptness with which accounts are being paid, the value of each month's sales, the extent of installment sales, losses from bad debts, losses caused by fraudulent buying and fraudulent checks, etc. This data will not only be



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COMPLETE POWER TRANSMISSION EQUIPMENT
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Belt Tighteners and Adjusters (all types)
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MANUFACTURERS OF METALLIC BAR FINISHING EQUIPMENT
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MEDART

EVERYTHING IN LINE SHAFTING EQUIPMENT

TIMKEN BEARING EQUIPPED

DRIVE RIGHT
MEMBER OF POWER TRANSMISSION ASSOCIATION

valuable to the retail trade but also to the wholesaler and manufacturer.

Wholesale Prices—The recession of wholesale prices which began last August continued through February of the present year, as shown by information collected in leading markets of the country by the Bureau of Labor Statistics, and with 1926 as the basis of 100, we find the following changes for paper and pulp:

Feb. 1929	Jan. 1930	Feb. 1930	Purchasing power of the dollar, Jan. 1930
87.8	87.3	87.3	114.5

Employment and Pay Rolls—A decrease in employment of 1.8 per cent is shown for February as compared with January, and with 1926 as the monthly average of 100, we find the following changes for

	Employment			Pay roll totals		
	1929	1930		1929	1930	
	Feb.	Jan.	Feb.	Feb.	Jan.	Feb.
Paper and pulp	94.5	95.5	96.0	95.7	98.6	96.4
Paper boxes	92.2	99.9	92.8	97.4	106.4	96.4
Paper and printing	99.6	103.8	102.1	103.2	109.4	106.3

Interstate Commerce Rulings—Rates on printed and unprinted waxed wrapping paper, waxed-paper wrappers, pulpboard boxes, knocked down flat, other than corrugated and paper ice cream can linings, in mixed carloads, from Menasha, Wis., to all destinations in central territory, were found not unreasonable or otherwise unlawful in a recent decision by the Interstate Commerce Commission (Menasha Printing and Carton Co., No. 21271).

In Missisquoi Pulp and Paper Co. (No. 21189), the Commission held that the rate on wood-pulp board and binders' board, in carloads, from Sheldon Springs, Vt., to Wash., D. C., were unreasonable and prescribed a reasonable rate for the future, with the award of reparation.

In West Dudley Paper Co. (No. 21279) the Commission holds that rates on imported wood pulp from Boston to West Dudley, Mass., over an interstate route and to Manchester, Conn., were unreasonable, prescribing reasonable rates and awarding reparation.

Proposed increased rates on paper stock, in carloads, from St. Louis, Mo., to points in Illinois, were found not justified in I. & S. Docket No. 3324, and the suspended schedules were ordered cancelled and proceedings discontinued.

Rate on printed waxed wrapping paper, in crates, in less than carloads, from Newberry, Pa., to Menasha, Wis., were found unreasonable in another decision (No. 21886) and reparations awarded.

In Colorado Paper Co. (No. 16058), the Commission holds that rates on building and roofing paper, in straight and mixed carloads, from Wisconsin, Illinois, and Missouri, to Pueblo, Colo., were not unreasonable and the complaint was dismissed.

Paper Notes of Interest—A New England paper company estimates that the substitution by its traffic department of steel bands for bracing rolls of paper eliminated the necessity of lining cars with heavy paper wrapper and thereby reduced by 50 per cent the loading cost of material and incidental labor, says the Transportation Division of the Department of Commerce, as a result of its recent Traffic Department inquiry.

Processes developed in further experiments by the Bureau of Standards to improve the durability of paper used in U. S. currency gave equally good results with commercial equipment and paper of similar quality is now being made commercially.

Of 73 sizes of paper bags examined by the Bureau of Standards in its investigation aiming at simplification of packing and wrapping in the mercantile field, only 12 were used by more than one store. The subject of simplification and standardization of wrapping and packing supplies will be developed in greater detail during 1930 it is hoped.

A consent decree was recently entered in the U. S. District Court of Albany, restraining eight defendants from maintaining a monopoly in the manufacture and distribution of union watermarked paper, under the Sherman Antitrust law, announces the Department of Justice.

Federal Trade Rulings—A final report on the newsprint paper inquiry has been about completed and will be forwarded to Congress at an early date. The inquiry will answer the question of whether any of the practices of the manufacturers and distributors of newsprint paper tend to create a monopoly in the supplying of newsprint paper to publishers of small daily and weekly newspapers or constitute a violation of the antitrust laws.

The set-up paper box industry held a conference under the auspices of the Federal Trade Commission at Cleveland on February 27th. Close to 400 plants applied for the conference, which seeks to establish rules of business practice for the elimination of unfair methods of competition.

Co-partners selling and distributing paper and twine recently signed a stipulation (No. 399) with the Federal Trade Commission agreeing to discontinue in their trade name the use of the word "mills" when they did not in fact own or operate a factory where they manufactured the products sold by them.

Paper Investigations by Bureau of Standards

"Curl" Sizing Test—The use of the "Curl" method of testing the degree of sizing of paper, which was originated in the bureau is apparently quite extensive. A recent survey showed that upwards of forty of the testers designed to apply this method are being used for a wide variety of writing, book and wrapping papers. In addition there are no doubt a number of users of the method who do not employ the tester. An interesting side development of the method is the use of a modification of it for testing the degree of curling of paper. In this case, instead of noting the time of maximum curling the extent of the latter is measured. This modification is used by several manufacturers of papers which are required to have a minimum degree of curling.

Cornstalk Fiber Products—Additional tests of commercial fiber products made from cornstalks show that progress is being made in such utilization of this waste material.

A sample of commercial cornstalk insulating board was found to compare favorably with standard commercial boards made from other fibrous materials. The average test values are: expansion, 0.56 per cent; absorption of water on immersion, 18.0 per cent; flexural strength, 12.9 pounds. These values were obtained by the test methods described in the report on fiber wall boards issued by the bureau and which contains similar data for various types of wall boards. Tests of boards prepared on a semi-commercial scale in the cooperative experiments of the Bureau of Standards and Iowa State College have shown similar values. Previous tests have shown that the insulating value of such boards is satisfactory.

Inspection of samples of the current production of commercial bleached cornstalk pulp shows that the shives and dirt so noticeable in previous samples have been eliminated.

Manufacture of Currency Paper—The results of further experimental study of manufacture of currency paper are given in the December, 1929, issue of the **Bureau of Standards Journal of Research**, under the title "Further Experimental Production of Currency Paper in the Bureau of Standards Paper Mill." This information was developed in the continuation of the investigation to improve the durability of United States currency paper, previously reported in the bureau Technologic Paper No. 329. The wear-resistant quality of currency paper was very much increased as a result of the experimental tests described in the earlier publication, but additional study of the paper-manufacturing processes with a view to further prolonging the service life of the currency was subsequently requested.

The study included the use of caustic soda as compared with lime for cooking the rags, the effect of variation in the fiber composition of the paper, the effect of modifications in the beating process, determination of optimum surface-sizing conditions for best printing results, and printing tests on the finished experimental papers.

The data showed that either lime or caustic soda is satisfactory as the digesting agent in the cooking process. Fiber mixtures of 75 per cent linen and 25 per cent cotton gave the best paper for currency use, although paper made from equal proportions of these fibers was of very good quality. Gradual application of roll pressure in the beating process was found

Eighty years of producing none but the very finest of papers provide an exceptional background against which to place manufacturing problems concerning special papers.

The knowledge, experience and skill derived from almost a century of unique specialization enable us to render material service in connection with high grade stocks for special purposes.

L. L. BROWN PAPER COMPANY

Ledgers, Linens & Bonds

ADAMS — MASS.

Established 1849

to be essential to best results. Formaldehyde proved better than alum as glue preservative in the surface-sizing bath.

Comparative tests of commercial manufacturing procedure and bureau practice were made at the request of manufacturers desiring the produce paper of the type developed in the investigation. The experimental procedure gave equally good results with commercial equipment and paper of similar quality is now being made commercially.

Description of the manufacturing procedure, tables of experimental data, and discussion of the results are included in the publication. (Separate copies of this publication, Research Paper No. 121, are available for purchase from the Superintendent of Documents, Government Printing Office, Washington, D. C. for 15 cents, each.)

Gift to Mr. Naylor

At a meeting of the Tissue Paper Manufacturers' Association held on Thursday afternoon, February 20, at the Hotel Pennsylvania, New York City, the retiring secretary, E. H. Naylor, was presented by the manufacturers with a complete solid silver dinner set in appreciation of his fifteen years' service as their secretary, and as an expression of the warm friendship and high regard which each manufacturer feels toward Mr. Naylor.

Mr. Naylor resigned because his duties as secretary and counsel of the Writing Paper Manufacturers' Association, with which he has been connected for more than sixteen years, have so increased of late as to make it necessary for him to devote his entire attention to the Writing and Cover Paper interests. He asked to be relieved a year ago but was urged by the members to remain a while longer. Mr. Naylor is succeeded as secretary of the Tissue Paper Manufacturers' Association by Herbert Thwaite, formerly with the Frank L. Scott Company, of New York.

Annual Banquet of Paper Stock Dealers

One of the enjoyable events on the social program of Paper Convention Week in New York was the twenty-second annual banquet of the New York Association of Dealers in Paper Mills' Supplies, Inc., on the evening of February 18 in the Hotel Commodore. Upwards of 200 members and guests, including an exceptionally large number of mill representatives who were in New York for the paper association meetings, attended and enjoyed immensely the banquet and the fine vaudeville show following the serving of dinner.

There was no speechmaking, the evening being given over entirely to merry-making and to the entertainment provided by talented artists. However, Frederick H. Chase, a member of the Banquet Committee and acting for President Bert Lorenz, welcomed the members and guests in a few words spoken from the stage. The stage was built up about four feet from the ballroom floor, and so placed at one side of the room that everyone present had an advantageous seat to see the performers. Dancers, soloists, acrobats, and comedians furnished about two hours of entertainment, and a novel feature of the show program was a three-round boxing bout by two dusky maidens, which the crowd decreed was a draw. The party lasted until about midnight.

As usual, Walter H. Martens, of George W. Millar & Co., Inc., as chairman; Frederick H. Chase, of Daniel M. Hicks, Inc., and Alfred J. Moran, of A. J. Moran & Co., Inc., arranged the banquet and entertainment. Leading paper stock dealers of the metropolitan district, and quite a few out-of-town suppliers of raw material to paper mills, were present, and fully two score mill men attended as guests of the dealers.

The Gummed Industries Association announces that a sufficient number of manufacturers, distributors and users have accepted Simplified Practice Recommendation R114-30—No. 1 kraft sealing tape—to insure its general adoption. The Bureau of Standards reports a total of 310 acceptors of this recommendation. This is an unusually high total of acceptances being not far from the largest number which the Department of Commerce has ever received for any of its simplified practice recommendations.

To Members of the 53rd.....

GREETING!

It gives us great pleasure to add our welcome to the chorus of congratulations on this—the 53rd Annual Convention of the Association!

It is, indeed, a notable event, signaling the beginning of another year in the life of this most important group in the industry.

The splendid progress made during the past is a testimony of the loyalty and efficiency of the men of this Convention, since no industry can be greater than its leaders.

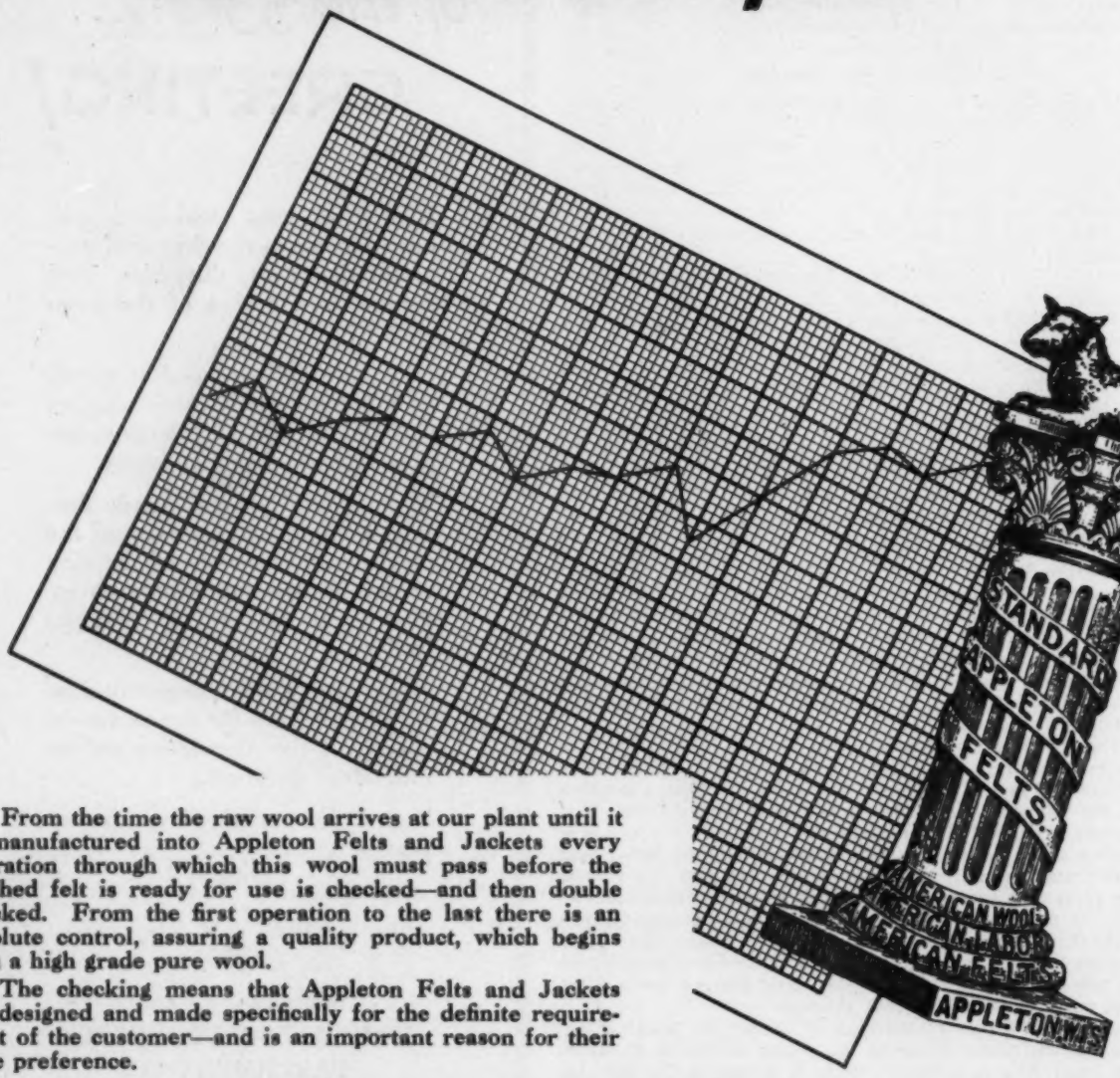
Accept again our congratulations with best wishes for the continued success of the Association and its individual members.

Yours for another prosperous year—

Cordially

KALAMAZOO VEGETABLE PARCHMENT CO.
KALAMAZOO, MICHIGAN

Checking *that means* Much *to you*



From the time the raw wool arrives at our plant until it is manufactured into Appleton Felts and Jackets every operation through which this wool must pass before the finished felt is ready for use is checked—and then double checked. From the first operation to the last there is an absolute control, assuring a quality product, which begins with a high grade pure wool.

The checking means that Appleton Felts and Jackets are designed and made specifically for the definite requirement of the customer—and is an important reason for their wide preference.

APPLETON WOOLEN MILLS
Appleton, Wisconsin

Appleton
Felts and Jackets

WISCONSIN

Optimistic Outlook Among the Mills

Additional building operations among paper mills of Wisconsin give indication of optimism for a business volume at least equal to or better than that of the last year. The general tone of the industry since the first of the year has been good and operations have been reasonably steady everywhere. Some immediate expansion efforts have characterized certain of the mills and in one instance a building program scheduled for the late spring was started immediately.

This latter project was two additions to the finishing rooms of the Kimberly-Clark Corporation's mill at Kimberly, Wis. Plans were all drawn but the contract was to be let later in the spring. The company decided to build at once and authorized Fluor Bros. Construction Co., of Oshkosh, Wis., to proceed. The project will exceed $100,000.

One of the units is one story, 122 by 127 feet, and will be equipped with supercalenders, cutters, trimmers and rewinders, and also will have locker and comfort rooms for employees. The other unit, triangular in shape, will be two stories, 146 by 225 feet and will provide paper storage. It will have a five-ton freight elevator. Both are of concrete, brick and steel and have automatic sprinkler devices and safety appliances. O'Keefe-Orbison Engineering and Construction Co. are the engineers.

The Kimberly-Clark Corporation also is dismantling the paper machines in its Atlas mill at Appleton, Wis., one of the oldest in its group. In their place the company will install six machines and start printing wall paper for the trade. This specialty has been manufactured for sometime, but only tinted stock has been marketed direct. The papermanufacture has been transferred to the newly acquired Lakeview mill at Neenah, Wis., but the converting department has been operating as usual at the Atlas mill.

Expansion is under way at the George Banta Publishing Co., Menasha, Wis., where a third story 90 by 135 feet will be added to the original factory building. The composing room will be enlarged and part will be used for store. C. R. Meyer & Sons Co., Oshkosh, Wis., has the contract. This is the third large addition to the plant within about two years.

The Flambeau Paper Co., Park Falls, Wis., is making preliminary surveys along the Flambeau river for another dam to supply the mill with power. The feasibility and costs are being estimated before the company decides to proceed.

Increased capacity also is being provided at the Tomahawk Kraft Paper Co., Tomahawk, Wis., where a large addition is under way. It will be of brick and concrete and will house additional machinery. Day labor is being used.

Seven Students Enrolled at Institute

Technical facilities of the paper mills will be improved through two important projects, one the launching of the new Institute of Paper Chemistry at Lawrence college, Appleton, Wis., and the other, the movement to erect a $900,000 laboratory for the United States Forest Products Laboratory, Madison, Wis.

Seven selected students were enrolled when the paper institute opened in February at the college, under the direction of Dr. Otto Kress, well-known chemical engineer. He will teach four courses dealing with microscopy of paper fibers, dyeing, testing and pulping processes.

The movement for the new laboratory at Madison rests with Congress. A bill appropriating $900,000 received endorsement of the agricultural committee of the House and has been introduced by Chairman Haugen. The State of Wisconsin has been clamoring for this building for a long time and has donated a site at the University of Wisconsin.

While net earnings of the Eddy Paper Corporation, Milwaukee, for the year 1929 were somewhat unfavorable, the company's financial position was much stronger. Net profit was $386,022.58, but after taking care of depreciation was reduced to $908.66. This compares with $524,284.53 in 1928

WE PRODUCE

the original motor driven Board Tester which gives the correct test from 40 lbs. to 600 lbs. per square inch. Adopted by Railroad Classification—See Rule 41, Book 4.

▲▲▲

ALSO

Scales for giving weight in pounds per 480 or 500 sheet count or in Kilograms 500 sheet count on Paper, Felt, Tissues, or per thousand square feet on Box Boards.

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ALSO

The most universally used Micrometer on the market today, the only Desk Micrometer having direct working. No Gears or Pinions to wear out or become inaccurate. 6 Inch dial.

E. J. Cady & Company

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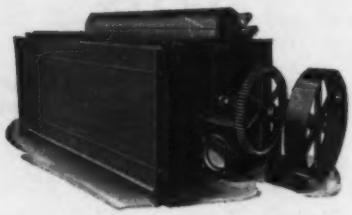


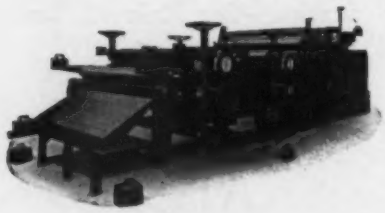
DECKERS

PULP OLD PAPERS

We offer a wide choice in vat design to suit every requirement. This machine in your pulp mill, as a multi-cylinder washer for old magazine or bleached stock, or the special design for handling mixed papers for Boxboard will meet your most exacting specifications.

Our long experience enables us to market these high grade machines at a very reasonable price.

Sizes: 30" x 48" up to 48" x 120"

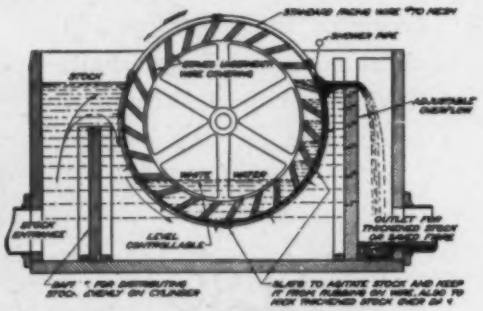


New and Improved Rogers and Special Wet Machines

The standard machine for producing high density sheet pulp for direct use or for Dryer. A low cost, simple, well proven means for reducing your labor, power and upkeep. All Rolls and Cylinders equipped with roller or ball bearings.

When dry stock is not desired the Single Press will handle the same high capacity with the same labor at still lower cost.

Built in units of 50 tons capacity or less

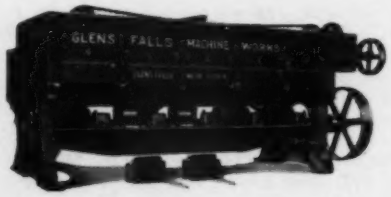


A. D. WOOD Thickener Saveall, Washer, Water Filter

The design of this popular machine is such that the cost per unit of material handled is amazingly low.

The wire does not have to drive and carry a couch roll, nor even help to discharge the thickened stock. Long life results and, with the sturdiness of the remaining parts, makes it almost automatic in operation, so seldom is any attention necessary.

Glens Falls Rolling Action Flat Screen



CONSTANT EFFICIENCY, HIGH SCREENING CAPACITY AND CLEANER STOCK

Troubles eliminated	*Advantages given*
Toe Blocks	Smooth, Quiet Operation
Pound and Clatter	Freedom from Repairs and Adjustments
Diaphragm Distortion	Low Power Consumption
Variable Capacity	Constant High Capacity

GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

Waterous Ltd., Brantford, Ont. Manufacturing Agent

Mansfield, Bolton & Kent, 501 Fifth Ave., N.Y.C.
Eastern Representative

See pages 344 and 345 in the 1929 Paper and Pulp Mill Catalogue

before depreciation and income taxes, and $136,814.78 afterward. 1929 ratios were: Current assets $1,878,184.40 and current liabilities $432,994.07; 1928 ratios, current assets $1,923,867.11, current liabilities $730,854.45. Net sales of the mills in Milwaukee, Chicago, and Three Rivers and White Pigeon, Mich., were $7,045,998.40 for 1929, and $6,065,467.15 for 1928. Competitive conditions and low prices are a responsible factor, J. W. Kieckhefer, president, says, and believes further consolidations will be the result.

Power connections of the Dells Paper and Pulp Co., Eau Claire have been changed so the mill can be operated by current direct from the Dells dam or the plant of the Northern States Power Company. The building of new power lines followed a contract with the power company by which the paper mill subsidiary, the Eau Claire Dells Improvement Co., ceded its power rights to the utility in order to solve a problem of continuous water supply. Hereafter power will be supplied at low rates from the Northern plants.

Mills Oppose Reopening of Rate Cases

Paper mills of Wisconsin are putting up a solid front against attempts of the Central Freight Association to reopen old rate-making cases specified in a petition filed with the Interstate Commerce Commission. The Wisconsin Paper and Pulp Manufacturers Traffic Association has joined in the fight and has added extensive briefs on the subject to those already filed in protest. Freight rates which were considered equitable and satisfactory were fixed by the commission eight years ago when the Minnesota and Ontario Paper Company, International Falls, Minn., was given a hearing on existing rates. The decision was accepted as final and the rates have been used as a precedent in many instances. Mills claim the railroads petitioning for the rehearing have no participation in the traffic affected. The Champion Coated Paper Company also is objecting to the reopening, because its case against the A. G. S. Railway now pending for more adequate rates as compared to those of Wisconsin mills will be weakened. Another objector is the Fox Paper Company, which wants its interests protected.

Another important rate case under consideration by the I.C.C. is that of the United Paper Board Company, which asks lower rates to Wisconsin points. The Ann Arbor railroad is objecting. C. W. Griffin, examiner for the commission, had recommended lower rates from certain Illinois and Indiana points to most Wisconsin points except the Great Lakes ports.

Albert Warner Priest, Appleton, Wis., passed away recently. He founded the Fox River Paper and Pulp Mill at Kaukauna, Wis., in 1882 and leased it in 1890 to Oscar Thilmany. In 1888 he founded the Outagamie Paper and Pulp Co., and operated this mill until recently when it was purchased by Patten Paper Co., Ltd. He was president at the time of his death of the Hayton Pump and Blower Co., and Eagle Mfg. Co., Appleton; and the Green Bay Wire Works, Green Bay. Mr. Priest's estate totaled $840,000.

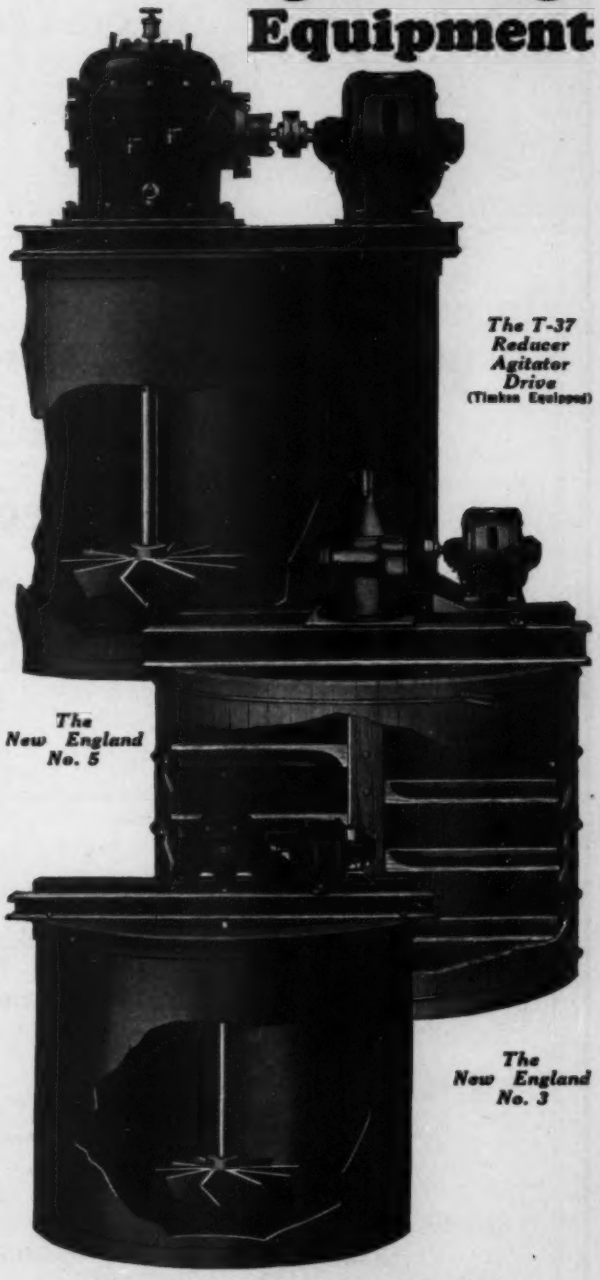
Stockholders of the Thilmany Pulp and Paper company at their annual meeting voted to pay dividends on preferred stock when declared by the board of directors instead of on March, June, Sept. and Dec. 15, as provided in the articles of incorporation. An amendment to the articles providing for this change and signed by Karl E. Stansbury, vice president and G. J. Stansbury secretary, was filed with the register of deeds. Preferred stock of the Thilmany company pays 7 per cent.

The Paper Package corporation was recently incorporated here with 250 shares at $100 each. The concern will deal in paper, paperboards, paper goods, boxes, labels and specialties. The incorporators are E. J. McMurchie, H. Kahler and G. Kahler.

F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, Neenah, Wis., has been elected a director of the newly organized Wisconsin Bankshares Corporation of Mil-

for fillers—sizes—colors use

New England Agitating Equipment



The T-37 Reducer Agitator Drive (Timken Equipped)

The New England No. 5

The New England No. 3

Ready to put to work—strong rugged units designed to operate with maximum efficiency and economy. Send for complete details and specifications.

The New England Tank & Tower Co.
Everett, Mass.
30 Church St., New York

THE MEAD PULP & PAPER CO.

Founded in 1846

by

DANIEL E. MEAD

Manufacturers of

"Enamaline" High Grade Coated Paper

and

Magazine Book Papers

Mills at— Chillicothe, Ohio, Kingsport, Tenn. } Capacity 375 Tons Daily

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THE MEAD SALES CO., 230 Park Ave., New York, N. Y.
THE MEAD SALES CO., 111 W. Washington St., Chicago, Ill.
THE MEAD SALES CO., Callahan Bank Bldg., Dayton, Ohio

waukee, Wis., an organization which owns a large group of Wisconsin banks. He also has been re-elected a director of the Winnegamie Land Co., which owns the Butte des Morts Golf club, of Appleton, Wis.

Safety Activities

Culminating the most aggressive year Wisconsin has ever known in safety agitation and education, the annual Fox River Valley Safety Conference will be held at Green Bay, Wis., on June 4, 1930. The attendance will be at least 1,500 mill executives, foremen and workmen. Public demonstrations are planned in connection with the program, in order to emphasize a civic safety campaign which Green Bay has conducted. The general chairman of the conference is H. D. Banta, of the Hoberg Paper and Fibre Co. The program is now in preparation and will be announced later.

The Hoberg company and the Fort Howard Paper Co. took part recently in a safety school conducted for three days at Green Bay by Alfred B. Hoftiezer, of the United States Bureau of Mines. First aid in almost all kinds of emergencies was demonstrated.

The city of Marinette is having a weekly safety school at the present time, and at Appleton a winter series of safety sessions was closed on March 4 with a banquet and an address by George P. Hambrecht, state director of vocational education. The large attendance and success of a school conducted at Wisconsin Rapids, Wis., has led to plans for another next season.

One fatal accident has marred the outstanding safety program of the Kimberly-Clark Corporation, Neenah, Wis. Matthew VanGroll, a construction electrician, met death while painting covered cables on a switchboard at the Lakeview mill. He came in contact with the current accidentally.

In the reorganization of the Rhinelander Paper Co., Rhinelander, Wis., caused by the recent death of Webster E. Brown, president, E. O. Brown has been elected to that office. A. D. Daniels is vice president, Paul Browne is secretary, Spencer Brown, assistant secretary, N. F. Becker, treasurer, and Allan C. Brown, assistant treasurer. The board of directors also includes E. A. Forbes, M. H. Raymond and Fred Anderie. The Brown Paper Goods Co., also of Rhinelander, elected C. F. Brown, president, W. D. Brown, vice president, and Spencer Brown, secretary-treasurer.

Common stock of the First National Bank, Appleton, the financial center of the paper industry, has been split ten for one, each stockholder receiving ten shares of $10 par value each for one former share of $100. The old stock was quoted at $380 bid, and the new is $43 bid.

A fire loss of $45,000 was suffered recently by the American Bag Company, the Badger Bag Company, and the Powerstein Bros. Bag Company, of Milwaukee. Immediate replacement of the damage is planned.

F. J. Harwood, president of Appleton Woolen Mills, has been elected president of the Eagle Manufacturing Co., of Appleton, to succeed Albert W. Priest, deceased.

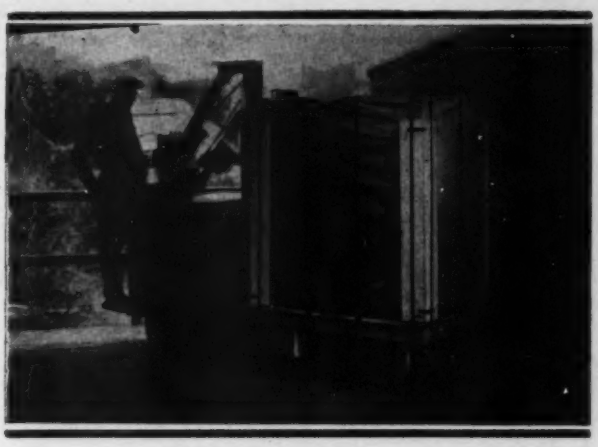
The Paper House of Milwaukee, Inc., was recently organized here with 100 shares at $100 each. The company will deal in all kinds of paper. Incorporators are C. E. Olson, J. A. Wolf, F. McKee and T. Schwab.

Allen Curtis Resigns

Announcement is made by International Paper Company that at a meeting of the board of directors on February 18 the resignation of Mr. Allen Curtis as first vice president was presented, to take effect March 1.

Mr. Curtis has been connected with the company since 1900, eighteen years as manager of department of manufacturing, ten years as a director, four years as a vice president, and since January 1, 1927, as first vice president.

Mr. Curtis is the son of the late Warren Curtis, one of the pioneer manufacturers of paper from wood pulp and founder of the pulp and paper industry at Corinth, N. Y.



Handling 3000 Pounds as easily as 300

Tests prove that savings ranging from 25% to 90% can be made through the use of skids as compared with old methods of packing.

The superior tensile strength and safety features of Stanley "Eversafe" Nailless Strapping together with the ease and speed of applying make it an outstanding contribution to economical handling and shipping.

The loaded skid can be strapped in a fraction of the time necessary to pack the same quantity in small units. The larger unit can be easily handled by one man and a lift truck and saves much of the expense and delay of frequent rehandling.

Send for full information on Stanley "Eversafe" Nailless Strapping System for skid shipments.

THE STANLEY WORKS
Box Strapping Division
New Britain, Conn.

Stanley "EVERSAFE" Strapping for Skid Shipments

Stanley Tightening and Sealing Tools

THE BROWN PAPER MILL CO., INC.

Monroe, Louisiana

(The World's Finest Wrapping Paper Mill)

All Sulphate
Wrapping
Bag
Liner

THE YELLOW PINE PAPER MILL CO.

Orange, Texas

(First Mill to Make Paper from Southern Pine)

500,000 POUNDS DAILY

Sales Office: MONROE, Louisiana

❖ NEW ENGLAND ❖

Satisfactory Operations in the Industry

Despite the unquestioned slackening in New England industry generally there is certainly less disappointment with paper business done thus far in 1930 than with cotton and wool textiles, shoes and leather and machinery. In connection with machinery manufacturers a word is not amiss on this respect: textile machinery, stove and radiator, paper mill machinery and general jobbing foundries make up the four main classes of New England foundries. Of all these, paper mill machinery manufacturers are the only ones manifesting anything like capacity operations. In certain instances, capacity operations are assured for the remainder of the year, in others 75 per cent operations compare with 50 per cent in stove and textile trades.

It has always been said that paper, particularly fine papers are the last to feel the effects of a general business depression and quite often the last to recover. This "bromide" seems to be taken rather seriously by many for there is an inescapable air of pessimism that current satisfactory operations in the fine paper industry that centers on Holyoke cannot dispel.

At this point, it might be well to point to several paper mill projects that would indicate the reverse of pessimism: The Morart Paper Co., of Holyoke plans to increase plant space by 25,000 feet or more than double the present area, with new equipment to be installed. W. S. Miller Inc., of Middletown, Conn., manufacturer of folding boxes, has incorporated and will expand the business. Another box company, the C. F. Hatch Co., at Lawrence, maker of folding containers is expanding due to new large orders. Great Northern Paper Co., continues a steady replacement program of its old machinery, which without much fuss or notoriety is steadily increasing its output both at Millinocket, East Millinocket and Madison, Me. Work has begun on an addition to the plant of the B. D. Rising Paper Co., while the Smith Paper Co., Lee, Mass., is erecting additions to its Columbia and Niagara mills. The Robertson Paper Box Co. at Montville, Conn., has added a three-story addition for extra manufacturing space and storage. This company has been engaged in bringing all its machinery and equipment up to date. It is now adding a new boiler plant and heating system.

The Hollingsworth & Whitney Co., Holyoke, Mass. is planning a new boiler plant.

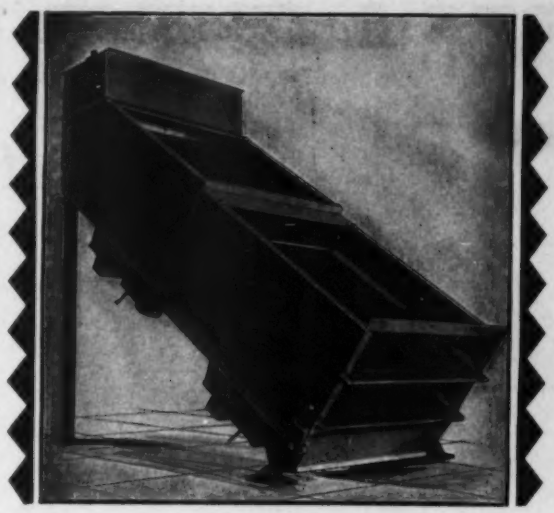
New Products

New Products by New England papermakers recently announced are of more than ordinary interest. Insulating board is now being made at the mills of the Pejepscot Paper Co., Lisbon Falls, Me. It is planned to market this product throughout the country.

This product is made entirely of wood fiber called Arborite, and the manufacturing rights and sale are owned and handled by the Wood Fibre Board Corp. of New York. The plant is ultimately to employ 300 and has already 100 at work. Plans call for a production of 175 million square feet annually. Edgar Rickard, president of Pejepscot Paper Co., is a director of the new company. Other directors are H. H. Jackson, of the Chicago Pneumatic Tool Co.; Gilbert C. Browne, of White Weld & Co.; Malcolm Stone, of Ludlow Mfg. Associates; Walter Aldridge of Texas Gulf Sulphur Co.; Julius Barnes, chairman of the U. S. Chamber of Commerce, and William Butterworth, of John Deere Plow Co.

Bird & Son, Inc., East Walpole, Mass., have developed a new product which carries them along further in the competition for packaging business with wood: a new heavy fiber board, testing 600 pounds and .16—a substitute for three-ply veneer wood, useful in the textile industry. The plan of distribution calls for sale of this product to mills with their own box plants who can take the fiber sheets, or to wooden box plants who will convert them.

Italiano Hand Made Vellum is a new paper by George W.



Hum-mer Electric
CHIP SCREEN

Thorough removal of sawdust and fine particles!
Small floor space required!
Low power consumption!
Immense capacity!
Fully adjustable screening angle and vibration!
No lubrication!
No destructive shaking of supports or buildings!
No belts or pulleys!
Trouble-free operation!

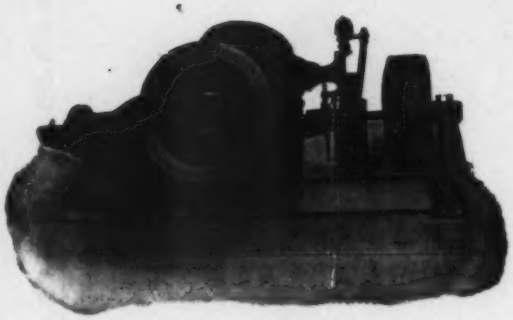
These are the features which make the Wood Chip Hum-mer a profitable investment for pulp and paper mills!

Write for Catalogue 54-P

The W. S. Tyler Company
Cleveland, Ohio

TYLER
FOURDRINIER
CYLINDER
CORDUROY
WIRES

WATERPOWER··



A Great Resource We have helped develop

The total waterpower resources harnessed to man's uses should be much greater than it is; vast power is wasted still.

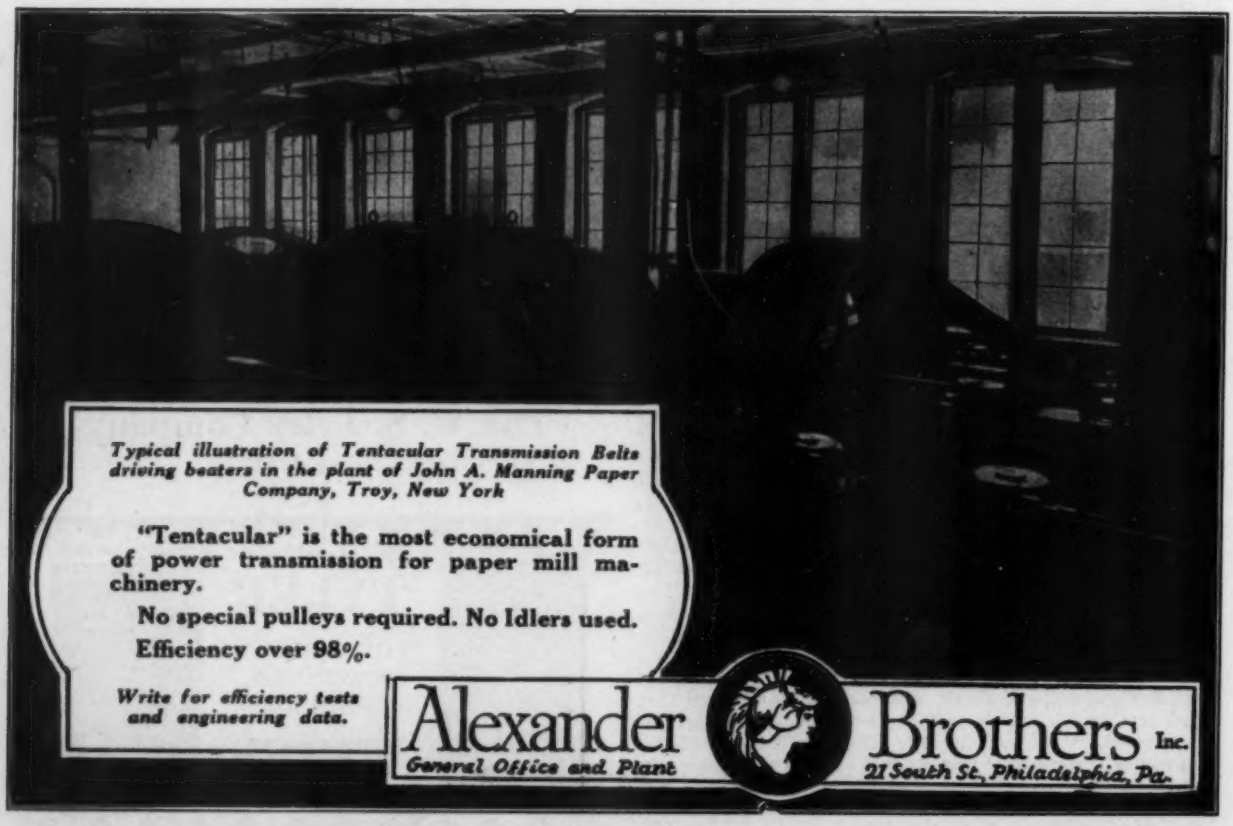
But we are doing our share. We have developed, economically and efficiently, upwards of *six million, five hundred thousand horsepower* . . . That is a staggering figure, made possible only because we have been making turbines and allied equipment for over fifty years!

Catalog 119 outlines a few engineering feats that will stir your imagination by showing how vast sources of power may be tapped—for you—with Smith equipment. *Write for it.*

S. MORGAN SMITH CO. HYDRAULIC TURBINES

Department T York, Penna., U. S. A.

Boston—Chicago—Salt Lake City—Denver—Portland, Ore.—San Francisco
(Associated Company—S. Morgan Smith—Inglis Co., Ltd., Toronto, Canada)



Typical illustration of Tentacular Transmission Belts driving beaters in the plant of John A. Manning Paper Company, Troy, New York

"Tentacular" is the most economical form of power transmission for paper mill machinery.

No special pulleys required. No Idlers used.

Efficiency over 98%.

Write for efficiency tests and engineering data.

Alexander Brothers Inc.
General Office and Plant
21 South St, Philadelphia, Pa.

Wheelwright Paper Co., Leominster, Mass., for folders and boardsides which aims to "glorify the advertising message." It has a handmade finish and is sold in eight colors and white, light and heavyweight and deckle edges.

The Bird Suggestion Plan

Bird & Son, Inc., East Walpole, Mass., announces that during the year 1929 a total of $3,600 in prizes have been awarded to employees under the suggestion plan which has for several year been included in their policy.

Suggestions numbering 1,274 were made by 359 employees. Some 189 persons had the pleasure of seeing their suggestions put into practice and received awards for them. Over half of these suggestors were successful in obtaining some award. They were divided into three classes: first; those representing improvement in product or a new product, for which service two of the prizes were awarded; second, suggestions effecting a reduction in the cost of manufacture, this class numbered 73; third, suggestions of intangible value under which heading 315 were classed.

In addition to the regular suggestion plan, a number of special cash awards were made during the year for suggestions of unusual merit.

Bankruptcy sale of the paper box plant of E. S. Hill & Co., Inc., took place on the premises in Salem early last month. Paper stock, machinery and other assets were disposed of by auction.

Penobscot Chemical Fibre Co. has installed new screen equipment further improving the quality of its well-known sulphite and soda pulps.

Hollingsworth & Whitney Co., Holyoke, Mass., has issued its annual statement which shows a gratifying condition in view of the present and immediately prospective general business conditions. The inventory is smaller, cash account larger. The company has total assets of $21,952,000. The item of cash and securities stands at $5,784,000 compared to $4,798,000 a year ago. The investment of H. & H. Ltd. of Canada stands the same as last year at $3,977,000. The Brassua storage is valued at $373,300. Merchandise inventory stands at $2,991,000, compared to $3,328,000 at the same time last year. Receivables are $754,000 compared to $1,463,000 last year. The company has no indebtedness beyond capital stock and $1,148,000 of accounts payable.

In response to query from the New England Council to Massachusetts manufacturers as to ways and means adopted to maintain operations during periods of depression, Eaton Crane & Pike converting paper manufacturers of Pittsfield, Mass., state that their plan embraces the arrangement of production of new items in dull sales seasons, budgeting of raw materials, production and sales expenses, enlisting employee co-operation in eliminating waste, and applying other measures recognized as fundamental in modern management.

Traffic Items

The State of New Hampshire which filed a complaint against all-rail rates on bituminous coal from Clearfield, Westmoreland and other coal producing counties of Pennsylvania to Boston & Maine R. R. points within the Granite State has petitioned the I. C. C. for permission to consolidate its complaint with that of the New England Paper & Pulp Traffic Association. A hearing scheduled for this month on the New Hampshire complaint will probably be postponed.

A new basis of freight rates on pulpwood loaded on the Maine Central railroad from vessels at Portland Me., has been proposed by the Maine carrier. The new proposal follows a summer and fall of exhaustive tests to determine what (in their opinion) is a fair minimum carload weight for various sized cars. The aim is to translate present per cord rates into rates per 100 pounds. There are at least four mills regularly bringing pulpwood from the Maritime provinces to Portland and thence by rail to their mills over the Maine Central viz.:

RYERSON

Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

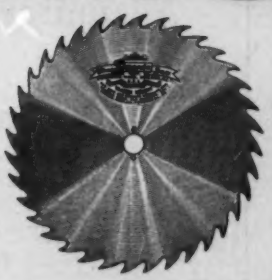
JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee St. Louis Cincinnati Detroit
Cleveland Buffalo Jersey City Philadelphia Boston

STEEL

SIMONDS

Circular Saws and Machine Knives



For pulp and paper mills it is economy to use Simonds Saws and Barker, Chipper and Paper Cutter Knives because they hold their edge longer and cut faster. They are backed by a near century of experience. Write for catalogue and prices.

Simonds Saw and Steel Co.

Established 1832
Fitchburg, Mass.

Boston Chicago

1864 1930

KNOX "EXCELSIOR" WOOLEN COMPANY

FELTS & JACKETS

CAMDEN, MAINE

An unbroken service record of sixty-six years has placed us in the lead for quality and uniformity of products.

We can be of service to you if you are looking for felts to meet higher speed conditions or desire better finish.

Seamless felts for fast running
Satin style felts for finish
Special felts to meet every condition
Send us your felt problems

the Oxford Paper Co., at Rumford, Hollingsworth & Whitney Co., at Waterville, International Paper Co., at Livermore Falls, and S. D. Warren Co., at Cumberland Mills.

The State of Maine through its representatives and Senators is protesting volubly against the proposed restriction of Canadian immigration. The Maine legislators testified before the House immigration committee that they saw no need of restricting the entry of Canadians and if such a measure was adopted they insisted that some provision be made to allow the temporary entry of skilled seasonal workers who are vital at certain seasons to the paper industry of Maine, the Pine Tree State's most important industry; Canadian mills paid around $6.50 per cord for pulpwood while American mill paid $16. French Canadian woodsmen are said to be the best is the world.

Miss Kiely Again Endorses Rag Papers

Speaking informally before the paper division of the New England Purchasing Agents Association last month, Miss Helen U. Kiely, Chief of Research for the American Writing Paper Co., discussed book papers in the main and answered many pertinent queries. Among the most interesting of these was her reasons for the preference for permanence of rag over wood fiber. The cotton fibers she said are tubular and relinquish moisture slowly, the flat wood fibers rapidly and this must be true to a more or less extent regardless of their purity. From her past summer's visit abroad she arrived at the conclusion that no British or German papermaker would accept purified wood fibers for paper meant to last 50 years or more. They wanted to be shown of an ageing over that period of time. Miss Kiely stressed lack of moisture for much of print shop difficulty with book paper. She recommended papers of low acidity and a minimum of bleaching for longevity and mentioned that much of the favorable reaction to rag stock is due to finding hooks on all wood papers 10 years old which were ageing so rapidly as to indicate that they would have no use in another period of years.

Miss Kiely touched on the variety of qualities found in new cotton cuttings and emphasized that two lots of these may differ as to papermaking values according to bleaching and other processing previously undergone before delivery at the paper mill. She outlined tests, indicated the limitations of the glarimeter, and the vacuum system of drying.

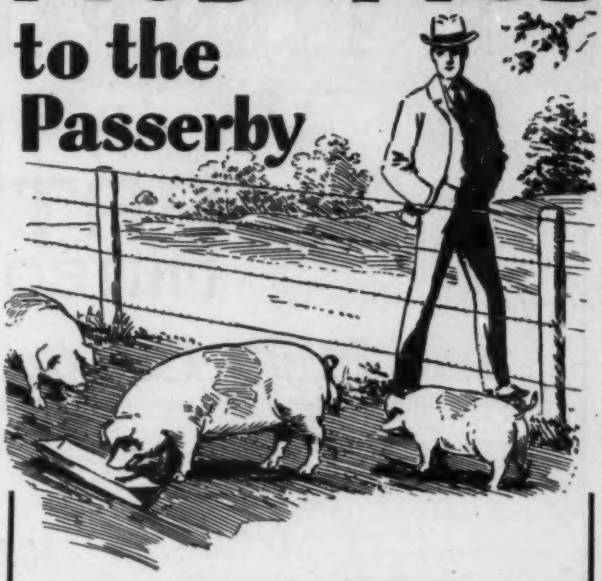
A $4 extra dividend was declared in February by the United States Envelope Co., in addition to the regular semi-annual dividend of $4. The Company earned $29.92 on its 26,250 common shares after paying preferred dividends against $20.32 in the previous year.

The International Paper Co.'s steamer Humber Arm, is tied up at National Docks, East Boston until Spring. She was unable to reach Cornerbrook, N. F. on account of ice with her cargo of 20,000 paper cores from a newsprint cargo which has been unloaded along the coast. It was announced here that the steamer Corner Brook of the same Company returning from a voyage with a cargo of newsprint for Houston became enmeshed in the ice off the Humber river and is still frozen in.

The Missisquoi Corporation, formerly the Missisquoi Pulp & Paper Co., has won a case against the Central Vermont R. R. which was carried to the I.C.C. It involved rates on binders and wood pulpboard from Sheldon Springs, Vt. to Washington, D. C. The commission prescribed a rate not more than 2c per 100 pounds greater than that in effect from the same shipping point to Baltimore and reparation to that basis. In a complaint against the Boston & Maine R. R. on soda, rosin size, alum and waste paper rates from Boston and other Mass., points, Missisquoi Corp., was refused relief.

Freight rates on the new steamship service from Boston to Gulf ports will vary from each inland point, but in all cases will be less than the corresponding rates via the Morgan lines and New York City except in western Connecticut. A rate

PIGS is PIGS to the Passerby



Pork on the hoof is just so much pork. Pork in the packing house is another thing. And in the skillet, Poland China and razor-back are ENTIRELY different. Even pigs have varied personal values.

Machinery, too, differs widely. Motors of the same size and rating develop a wide range of power. Beaters, jordans, felts—and many other things incidental to paper making—may look alike to the passerby. But they are NOT alike in action.

Beaters aren't all alike. And there are no beaters like Mid-West Hi-Speed Beaters. Mid-West has developed, out of years of specialized experience, a beater that is DIFFERENT—different in construction, in power required, in ability to handle a heavier furnish, in durability, and in first cost.

THE MID-WEST MACHINE CO.
Dayton, Ohio

Before you purchase any beater investigate Mid-West. Then you'll realize *"There Is a World of Difference in Beaters."*

Pacific Coast Representative
MR. JAY PLATT HAMERSLAG
655 Russ Bldg. San Francisco, Cal.

MID-WEST
High Speed Beaters

PATTEN PAPER CO., Ltd.

Manufacturers of

PATTEN
MIMEO-BOND

and High Grade Printing Papers

JUDSON G. ROSEBUSH, *Pres.*
A. C. REMLEY, *Vice-Pres.*
ERIC D. LINDBERG, *Sec'y.*
STEPHEN C. ROSEBUSH, *Treas.*

Mills at

Appleton and Kaukauna, Wisconsin

Office: Appleton, Wisconsin

Bryant Paper Company

Kalamazoo, Michigan

Manufacturers of

High Grade Machine Finish and Super Calendered Book Catalogue, Envelope and Lithograph Papers Coated Book and Lithograph

300 Tons
Daily Capacity

Specializing in Light Weights and Opacity Papers

from Bellows Falls to New Orleans on wrapping paper, for example, was given as 49c; from a western Massachusetts point to New Orleans on tissue paper of 45c. These figures compare with some 69c or 70c all rail. The Boston office of the company is Pier 40, Hoosac Docks.

It is understood that the Byron Weston Co. is installing a vacuum system of drying paper in place of steam heated rolls.

NEW YORK CITY

Wood Pulp Importers Elect

The annual luncheon-meeting and election of officers of the Association of American Wood Pulp Importers was held on February 6 in the St. Nicholas Club, New York City, and resulted in the election of George W. Oliphant, of Castle & Overton, Inc., New York, as president for the ensuing year, succeeding Orval A. Wales, of Johaneson, Wales & Sparre, Inc. Orvar Hylin, of the Lagerloef Trading Company, Inc., was elected vice president, succeeding Mr. Oliphant, William H. Anders, of the Perkins-Goodwin Company, was re-elected treasurer, and R. D. Hull, of the Mead Sales Company, Inc., was again chosen secretary.

The above officers, together with the retiring president Mr. Wales, will compose the board of directors of the association for the year. Howard E. Atterbury, of Atterbury Bros., Inc., was named National Councilor, and Frank C. Overton, of Castle & Overton, Inc., alternate National Councilor.

Millar Acquires Domestic Mills

George W. Millar & Co., Inc., of 284 Lafayette street, New York, one of the oldest, largest and most widely known paper concerns in the metropolitan district, has acquired the entire outstanding capital stock of the Domestic Mills Paper Company, of New York City, according to an announcement made by J. C. Mallalieu, president of the Millar corporation. The Domestic Mills Paper Company has been the sole distributor in this territory of a number of lines of paper, including certain of the products of the Warren Manufacturing Company, the A. M. Collins Manufacturing Company, and the Hoberg Paper & Fibre Company, and the business of the company has been taken over completely by the Millar organization which henceforth will handle and control the lines formerly sold by the Domestic Mills Company. M. L. Seiler, John H. McHugh and other salesmen of the Domestic Mills organization will become affiliated with the Millar staff.

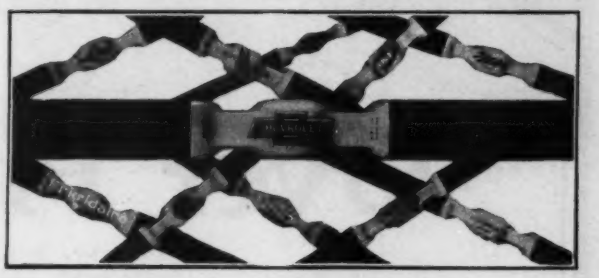
It will be recalled that in 1926 George W. Millar & Co., Inc., acquired control of the well-known firm of Holden & Hawley, Inc., dealers in fine papers, and at that time William H. Holden joined the firm of George W. Millar & Co., Inc., and continues in charge of the fine paper department of the company.

Coy, Disbrow & Co., Inc., paper merchants, are now comfortably settled in their new and larger quarters at 686-690 Greenwich street, New York, having moved recently from their former location at 311 Canal street. The new home of the company affords much more room, and is very conveniently situated near the main transit arteries.

Announcement is made that the Unity Paper Mills, of Potsdam, N. Y., which recently filed a voluntary petition in bankruptcy, will continue operations under a receivership composed of Bernard Wade and Arthur Martin, and that A. R. Melker, of 110 East Forty-second street, New York City, will continue as their sales representative. The mills manufacture book, magazine and bond papers, and their bankruptcy petition placed liabilities at $262,047 and estimated assets at $388,000, including the plant which was valued at $300,000.

Harry Lindquist, formerly sales manager of the Missisquoi Pulp and Paper Company, has been appointed eastern manager of sales for the Standard Division of the Sutherland

LET EVERY SHIPMENT ADVERTISE YOUR PRODUCT



Big By-Product Value
In Signode Strapping

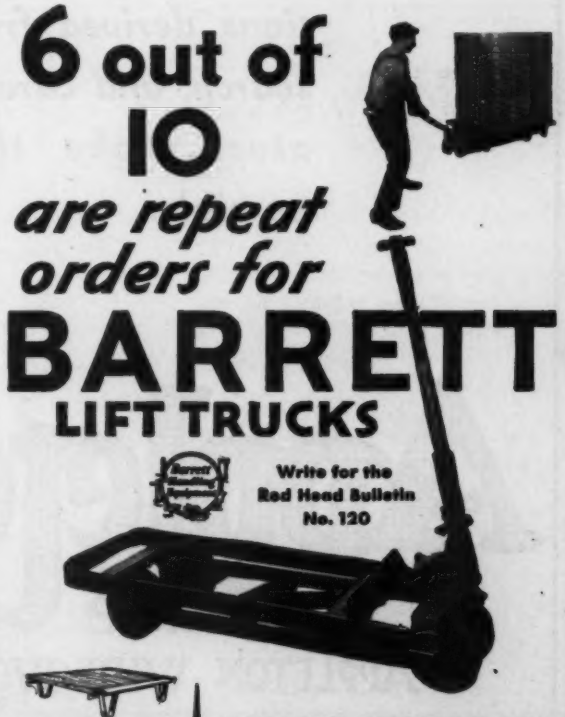
Every Signode strap that binds a shipment is drawn tight and locked in a beautifully lithographed Signode Seal.
This Seal is designed to carry your name or trade mark in its original colors just as it appears in your advertising.
In this way a perfect tie up is secured between your general advertising and every shipment.
Signode Steel Strapping applied to all types of shipments forms the safest and cheapest type of shipment.
Send us your name or trade mark and we will gladly make up a sketch, and quote prices, or let us send you sample seals made for other firms.

SIGNODE STEEL STRAPPING CO.
2608 N. Western Ave. Chicago, Ill., U. S. A.
Offices in Principal Cities
CANADIAN STEEL STRAPPING CO., Montreal, Quebec

SIGNODE
The Sealed Tensional Strapping

We also furnish round wire tensional reinforcements, all forms of nailed-on strapping, automatic wire tying machines, pail clasps, clutch nails, tag fasteners, etc. Write for general catalog.

6 out of 10 *are repeat orders for* BARRETT LIFT TRUCKS



Write for the Red Head Bulletin No. 120

Steelog Platforms Bulletin No. 250

BARRETT-CRAVENS CO.
3262 W. 30th Street, Chicago, Illinois

Affiliated with WALKER VEHICLE COMPANY, Chicago: manufacturers of electric street trucks and tractors. AUTOMATIC TRANSPORTATION COMPANY, Inc., Buffalo: manufacturers of electric industrial trucks, tractors and engines

Over Fifty Years

Experience in the manufacturing of wires for American and Foreign paper makers and the ever increasing use of Appleton Wires testify to their quality.

Looms of our own design, wire drawn in our own plant to specifications derived from exhaustive research, and carefully trained operators make this high quality possible.

Appleton Wires

are good wires

APPLETON WIRE WORKS INC., APPLETON, WIS.

Paper Company, Kalamazoo, Mich., and will make his offices in the eastern headquarters of the company at 51 East Forty-second street, New York.

A. J. Sachs, formerly secretary and general sales manager of the Public Service Cup Company, manufacturer of Lily Cups, has established offices at 110 East Forty-second street, New York City, where he will represent manufacturers of paper goods to the jobbing trade. It is Mr. Sachs' intention to confine his representation to a limited number of select lines of paper and paper products.

◆ NORTHERN NEW YORK ◆

Kamyr Machine at Dexter Reaches Full Production

The Dexter Sulphite Pulp & Paper Co. on Feb. 17 achieved a production of 80 tons of sulphite per day upon its new Kamyr wet machine, a device of Swedish manufacture and design, installation of which was begun last June. This company is now installing a bleaching system, which will be completed in about two months and which will provide 25 tons per day of bleached Mitscherlich, a very high grade of sulphite. No bleached sulphite is now being made by this concern.

While the Kamyr wet machine has been in operation since last August, full production was not reached until February, an expert set-up man from Sweden having been in Dexter for two months making necessary adjustments. The machine replaces five old machines and possesses the advantage of producing the pulp 55 to 60 per cent dry as compared with about 30 per cent dry on the ordinary machine. This insures a material saving in freight charges in that 25 to 30 per cent of water does not have to be shipped. Of its total production of 80 tons of this kind of pulp 35 tons daily is used in the company's own mills in the manufacture of paper for its bag department. The remaining 45 tons is sold to other manufacturers.

The machine was purchased through the Paper Machinery, Ltd., of Montreal, American representatives of the Swedish company holding the patents. G. D. Jenssen Co., New York City, is agent in the United States for Paper Machinery, Ltd. The machine is said to embody the latest design and equipment and is not duplicated in America. Full time operation is being recorded at the Dexter plant and Dr. James E. Campbell, president of the company, is of the opinion that the present production of 80 tons of pulp per day will be materially increased in the near future. These improvements adopted by the Dexter Sulphite Co. make its plant one of the most modern in the country.

The Hinde & Dauch Paper Co. plant at Watertown, which was closed down for six weeks, has been reopened, it was announced recently by the manager, W. H. Hollis. The plant was shut down temporarily because of lack of orders but recently business has picked up sufficiently to permit resumption of operations.

A. W. Bronk of Carthage has tendered his resignation as general superintendent of the kraft division of the Taggart Brothers, Inc. Mr. Bronk for the past two years has worked under Niles Pern, general manager of the kraft work at the Herrings, Carthage and Oswego mills. He came to Northern New York from Bellows Falls, Vt.

Theron A. Countryman, experimental engineer at the Watertown plant of Taggart Brothers, Inc., has been made manager of the Taggart plant at Oswego, to succeed Harry White. This plant is the largest of the Taggart group of bag manufacturing plants. Mr. White has been transferred to Los Angeles, Calif., where a new plant has been opened by Taggart Brothers, Inc.

Messrs. Gotman and Sokonovski, two of a delegation of paper mill engineers sent to the United States by the Soviet

When You Think of Felts

Consider Orr Characteristics

Strength

To withstand the terrific punishment to which they are subjected.

Texture

For maximum water removing efficiency—grade of product and machine speed considered.

Long Life

In comparative tests Orr Felts have shown longer life than others. Consider the saving a few days longer service out of each felt means to a mill in the course of a year.

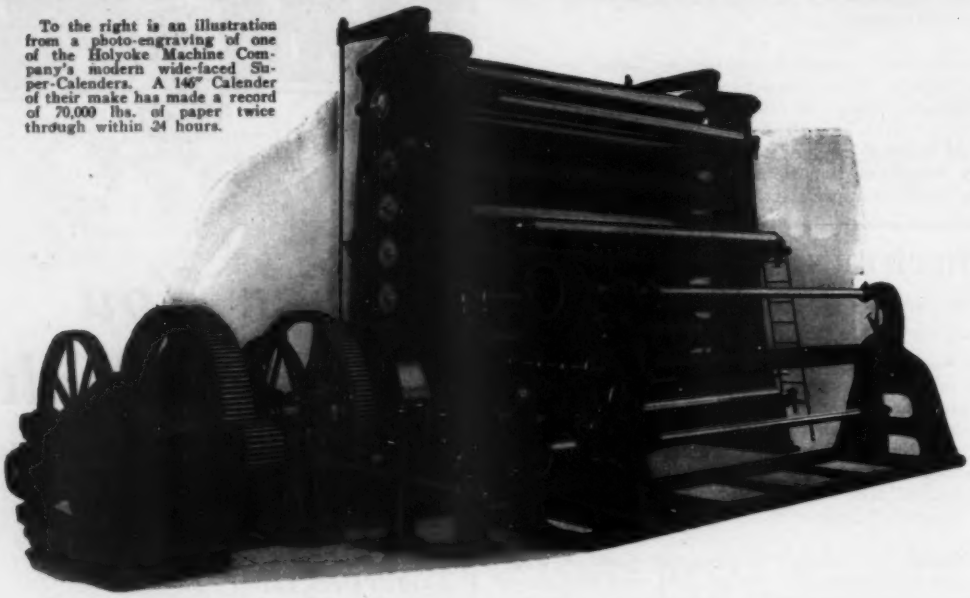
There is an Orr Felt for every need. An Orr representative will gladly assist you in finding the felt best suited to your requirements.

The Orr Felt & Blanket Co.

Piqua, Ohio

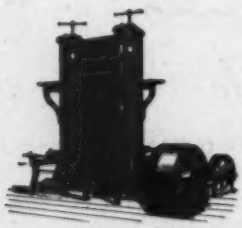
ORR FELTS

To the right is an illustration from a photo-engraving of one of the Holyoke Machine Company's modern wide-faced Super-Calenders. A 146" Calender of their make has made a record of 70,000 lbs. of paper twice through within 24 hours.



BUILT-TO-ORDER

By HOLYOKE



Superior Engineering Skill is part of the design and construction of every HOLYOKE machine. So much so, that while different installations may resemble one another in type, yet each machine is "Built-to-Order" in a very real sense. Special details, changes, and improvements are carefully included to meet the exact requirements of local conditions. When planning on new equipment or replacements write HOLYOKE Engineers, HOLYOKE Machine Co., HOLYOKE, Mass.

Since 1863

The print above is from a larger original wood cut of a HOLYOKE 36" Web Calender installed over fifty years ago. Constant improvements in stride with the times, plus high and unwavering standard of high quality, account for the LEADERSHIP of HOLYOKE.

Manufacturers of Super-Calenders, Platers, Cotton and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors.

The HOLYOKE MACHINE COMPANY

FOUNDED 1863

government of Russia to inspect and make investigations of paper mills and paper machine manufacturing plants, visited the Bagley & Sewall Co. plant at Watertown recently. C. W. Valentine, president and Edward S. Lansing, vice president of the company, showed the men through the plant.

At a recent meeting of the stockholders of the Bagley & Sewall Co. of Watertown all directors and officers of the company were re-elected.

Alfred F. Helin of Watertown has been granted a patent for a wire washing device for paper machines. He has assigned his rights to the Bagley & Sewall Co. of Watertown. The invention involves two patentable features. A description of it given out by the U. S. Patent Office reads as follows: "In a fourdrinier papermaking machine the combination of making wire, a spray pipe extending across the wire for directing wash water against the wire, and spaced nozzles or orifices formed in the wall of the pipe, the walls of which orifices converge transversely of the pipe."

Unsecured creditors of the Warren Parchment Co. of Dexter, which recently filed a petition in bankruptcy, will receive 25 cents on the dollar, for their claims through a compromise of settlement recently announced. What is to be done with the mill in the future has not been determined. The unsecured claims aggregate about $202,000, meaning a settlement of about $50,000.

Edward Brayton Sterling, 83, of Watertown, well-known Northern New York paper manufacturer, died at his home in Watertown on Feb. 20. Mr. Sterling was connected with the paper industry for nearly a half century. For a number of years he was president and a director of the West End Paper Co. of Carthage which was sold to the National Paper Products Co. in 1929.

The International Brotherhood of Paper Makers will cooperate 100 per cent with the Unity Paper Mills, Inc., of Potsdam, according to a report of the receivers, Bernard Wade and Arthur H. Martin, to federal court at Utica. The receivers state that officers of the paper union agreed that the mills may use dandy rolls without the payment of commissions. Adjudication of the mills in bankruptcy has been put off by Federal Judge Frederick H. Bryant. An effort is being made to arrange a settlement. The receivers report a net profit of $4,637 in two months' operation.

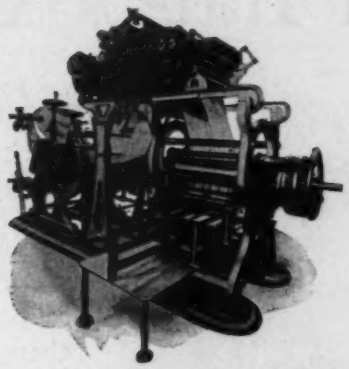
Air Photography for Foresters and Engineers

A course in air mapping has just been organized at Syracuse University for students of Applied Science and the New York State College of Forestry. This course will be under the direction of the Airplane Photograhic Department and is probably the first of its kind to be started at a university as part of the regular curriculum. The course is being financed under an endowment totalling approximately $60,000 from the Guggenheim Foundation for the promotion of aeronautics.

The importance of developing a course of this kind in forestry has been demonstrated by some of the large timber estimating projects of the West and in the Canadian forests. It is possible to make photographs from an airplane that will give the experienced forest engineer and reader of aerial photographs an idea as to the approximate amount of timber on a particular area as well as the types of forest, the topography of the country and the best routes over which ground cruising parties may be directed. By the use of airplane maps much of the former tedious work of ground survey has been obviated. It is now possible for ground parties to obtain data on a small area of timber and apply this data to the aerial maps over large tracts wherever the map reveals that type of forest.

The new course is headed by Prof. S. D. Saranson. Others on the staff are Prof. Leon B. Howe, instructor in drawing, Prof. Leroy A. Mullin and Prof. Earl F. Church formerly with the United States Coast and Geodetic Survey.

H-S MACHINE CO.



Four Color Printing Unit attached to No. 4 Folder and Embosser

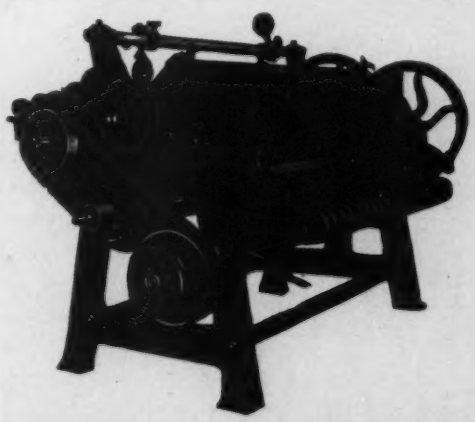
One of several designs used by Napkin Manufacturers and Converters. We design and manufacture Toilet Winders, Napkin Folders, Crepe Machines, Package Presses and Paper Specialty Equipment. Write for Catalogue.

Hudson-Sharp Machine Co.

GREEN BAY, WISCONSIN

Chicago Office: 574 Wrigley Bldg.

Manufacturers and Designers of Special Machinery



PAPER CUTTERS

Single—Duplex—Diagonal

CUTTER KNIVES

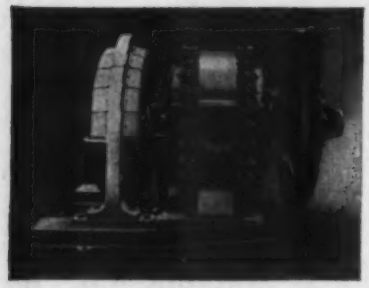
PATENT TOP SLITTERS

HAMBLET MACHINE CO.

LAWRENCE, MASS.

For flat-box service *on Fourdrinier Machines*

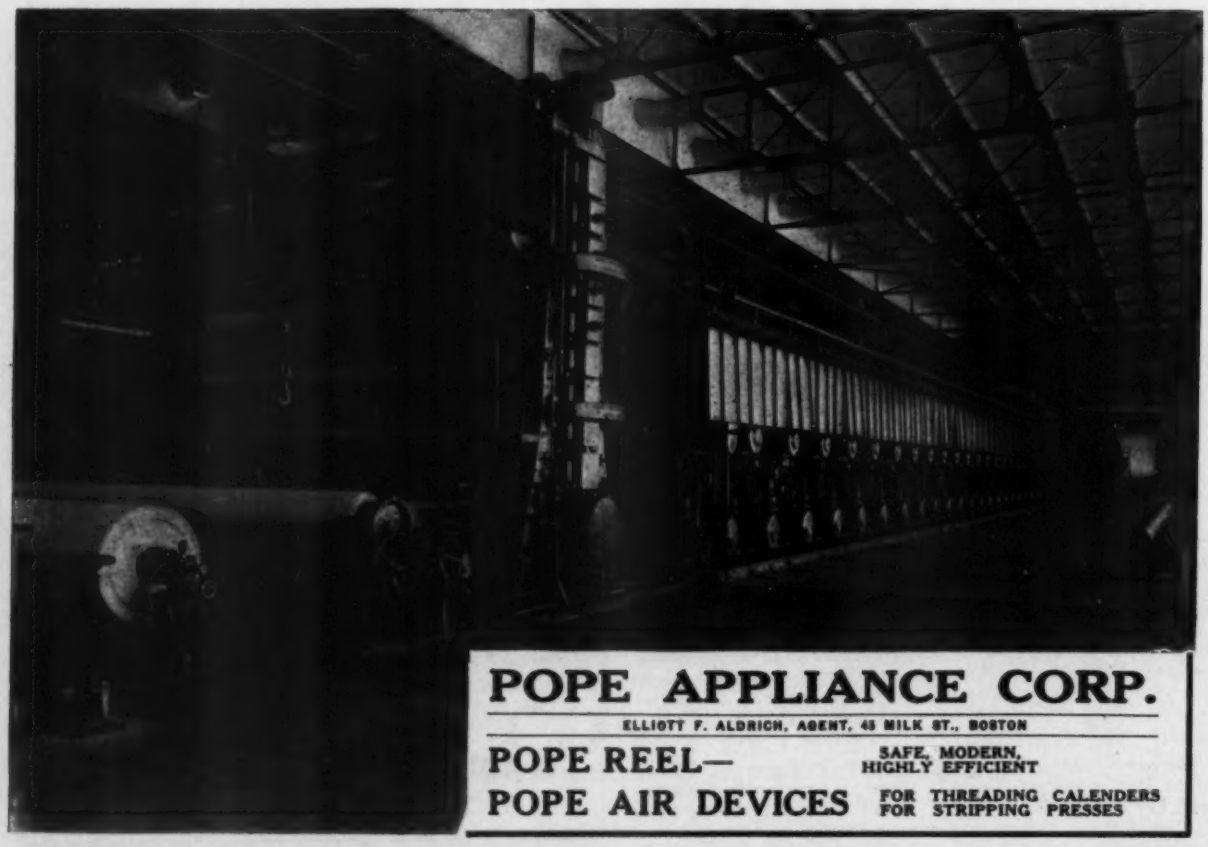
THE Jennings Flat Box Pump consists of two independent units . . . an air rotor and a water impeller . . . in a single contact assembly. It handles air and water separately. Power is saved because the air is discharged direct to the atmosphere. Only the water is pumped against a head. The air capacity of the pump is never affected by the volume of water being handled. If you are not familiar with Jennings Flat Box Pumps and Nash Hytor Vacuum Pumps for paper mill service, write for complete information.



Jennings Flat Box Pumps are furnished in capacities ranging from 150 to 5000 g.p.m. of water and 80 to 2300 cu. ft. per min. of air at 10 inches of vacuum. Water discharge heads from 5 to 25 ft.

Jennings Pumps

NASH ENGINEERING CO.
161 Wilson Road
SOUTH NORWALK, CONN.



POPE APPLIANCE CORP.

ELLIOTT F. ALDRICH, AGENT, 45 MILK ST., BOSTON

POPE REEL— SAFE, MODERN, HIGHLY EFFICIENT

POPE AIR DEVICES FOR THREADING CALENDERS FOR STRIPPING PRESSES

❖ OHIO ❖

Miami Supts. Hear Address on Felts

The Miami Valley Division of The American Pulp and Paper Mill Superintendents Association held a dinner meeting on Saturday, February 22, at the Hamilton Inn, Franklin, Ohio. There were thirty-eight in attendance, Marshall Barker presiding.

Wm. U. Hanke, superintendent of The Orr Felt and Blanket Company, Piqua, Ohio, gave a talk on the manufacture of papermakers' felts. He described fully the different qualities of wool for certain quality felts, the various operations necessary in the preparation and finishing of their products, and experiences they have had in paper mills. He also had a mounted chart of wools, together with a number of photographs of their equipment.

The next meeting will be held March 29, at the Engineers Club in Dayton, Ohio, a combined meeting of Paper Mill Superintendents and Printers of Dayton and vicinity. Norman Altman of Butler Paper Corporation, Chicago, will show motion pictures taken in various paper mills throughout the country, and will give a talk that will interest both the printers and papermakers.

❖ SOUTHERN ❖

Announcement has been made by R. H. Laftman, general manager of the Bogalusa Paper Co., Bogalusa, La., that contract has been closed for the large paper machine to be installed in the new addition to the paper mill at Bogalusa. The machine is similar to the one already in operation at the board mill of the company. It will be 112-inch trim and will require about three months to build. By the time it is completed, it is expected the new building at the paper mill will have been finished, and Mr. Laftman explained that the machine probably will be in operation by September 1.

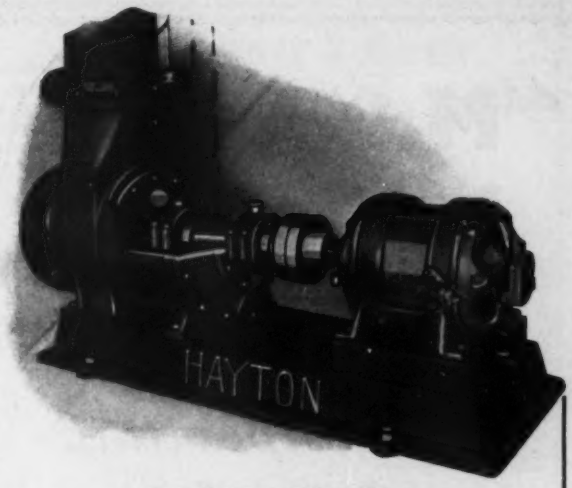
A committee for the purpose of interesting at least two paper mills in locating at Hattiesburg, Miss., has been appointed by the chamber of commerce of that city. Negotiations for a site probably will be started if the outcome of efforts to pipe natural gas into the city are successful, according to W. O. Tatum, president of the Hattiesburg chamber of commerce.

The Thrift Book Binding Co., has been incorporated under the laws of Texas with a capitalization of $20,000. The company which will operate at 1212 Baylor St., Austin, is headed by Lee S. Thrift, and will engage in a general book-binding business.

Gum timber in ample quantity is available in Georgia and the Southeast generally for the manufacture of better grades of paper products by the sulphite process, according to Dr. Poole Maynard, industrial geologist of the Atlanta, Birmingham & Coast railroad, who recently investigated the opportunities for manufacturers of pulp and paper products from Georgia woods. There are also available ample supplies of long leaf pine for manufacture of kraft papers, and slash pine, which has such a low resin content that authorities indicate its adaptability for the higher grades of paper products, stated Dr. Maynard.

Southern Paper Co., Ltd., manufacturer of folding paper boxes, with main offices at 535 Tchoupitoulas St., New Orleans, has taken over the three-story structure at 519 Magazine St., which will be used as a warehouse of the company.

The warehouse and manufacturing equipment of the Southwest Tablet Manufacturing Co., Dallas, Tex., were destroyed by fire recently at a loss estimated at $100,000. E. H. Perry,



Horizontal Type Agitator Pump

CENTRIFUGAL PUMPS
AGITATOR PUMPS

The number of repeat orders for agitator pumps, which we have received during the past few months, is the best indication of the satisfactory service these agitators are giving.

HAYTON PUMP & BLOWER CO.
Appleton, Wisc.

TANKS THAT LAST

Acid tank at Nekoosa-Edwards Paper Company, Pt. Edwards, Wis.

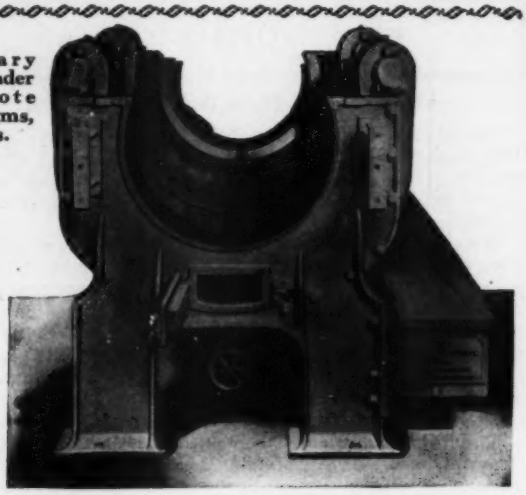
Kalamazoo tanks are made of best obtainable tank woods, built right—guaranteed tight.
Sixty years experience building Blow Pits, Acid Tanks, Stuff Chests, Agitators, etc., for the Paper Trade.
See our condensed catalog in Paper & Pulp Mill Catalog, Chemical Engineering or Sweets.
Ask about our new Tile Tanks for stock or bleach.

KALAMAZOO TANK & SILO CO., Kalamazoo, Mich.

"M & W" Rotary Screen

with important new features

View of Rotary Screen with cylinder removed. Note divided diaphragms, large openings.



Divided Diaphragms. Each diaphragm is divided into two sections, which move in opposite directions. The resulting balanced movement avoids all side strain on the cylinder, requires less power, and increases the screening capacity.

Discharge Openings at both ends of cylinder are much larger.

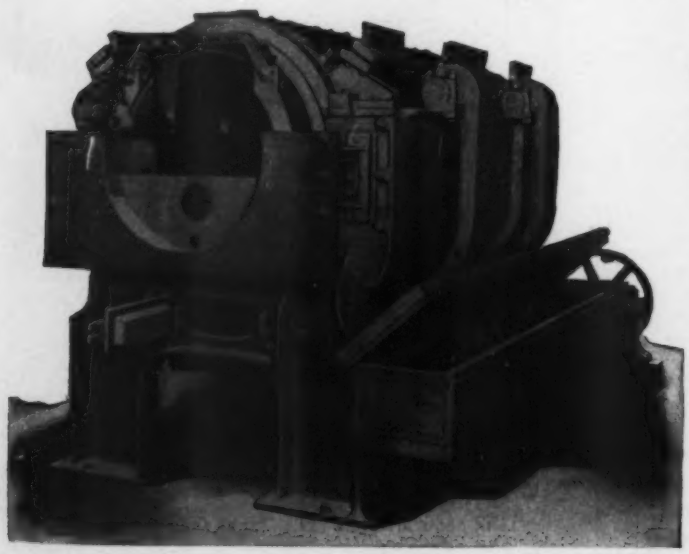
The "M & W" Rotary Screen now being placed on the market has been redesigned and built from practical paper mill experience. Recent improvements are fully covered by United States and Foreign Patents.

No Dead Stock in Cylinder. Improved discharge of stock from both ends of cylinder to flow box.

No Dead Stock in Vat. Pockets are prevented by diaphragm action and automatic flushing outlet.

No Packing Troubles. It is impossible for lumps *to get into screened stock.*

Note enclosed and accessible main drive, showerpipe, washout door for cleaning.



Self-Oiling Bearings. Shaft bearings and eccentrics are self-oiling, enclosed and protected from water.

New Shower Pipe—the Moore & White "Criss Cross" pipe that clears the screen plates so effectively.

Increased Capacity — Less Power — Reliable Operation at Low Cost

The Moore & White Co.
Philadelphia, Pa.
N. Phila. Sta. Penna. R.R.
Paper Mill Machinery

WRITE FOR NEW SCREEN BOOKLET

Jr., president of the company has offices at 304 Fifth St., Austin, Tex.

Reuben B. Robertson, president of the Champion Fibre Co., Canton, N. C., recently quieted the rumor that the company planned the establishing of a paper mill at Tuscaloosa, with the announcement that no expansion program of the company other than regular maintenance conducted by the company's own engineers and mechanics was contemplated.

Pouring of concrete for the foundation of the proposed one-story warehouse of The Paper Supply Co. of Houston, Tex., has been completed and work has already begun on the construction of the building, which it is estimated will cost $25,000. Contract for the building, which will be located at Texas and Broadway Sts., was awarded to Parker Bros., Inc. of Houston. L. R. Carroll is president of the company.

❖ MICHIGAN ❖

Michigan Paper to Build Power Plant

The Michigan Paper Co., with plants in Plainwell and Kalamazoo, is now working out plans for the erection of a very fine power plant at Plainwell, which when completed will call for a layout of about $350,000. It has been decided to build on the unit system, two units to be erected at once. Engineers are now preparing plans for this work.

At the annual meeting, reports for 1929 were highly satisfactory. Earnings for the year showed a material increase over 1928 and the outlook for 1930 is good. The coating division at Kalamazoo has worked full time for several months.

In the election of directors, L. H. Kirby, Kalamazoo, was added to the board.

The board of directors of the MacSimBar Paper Company was increased two in number at the annual election by the addition of Chapin Dewing and L. H. Kirby, both of Kalamazoo.

Meeting Cost and Technical Associations

The third annual interstate meeting of the Cost and Technical Association of the paper industry will be held in Kalamazoo, May 23rd and 24th, according to Harry C. Bradford. The date was determined at the Kalamazoo Valley division meeting, held January 29th, at the Columbia hotel.

This gathering will bring to Kalamazoo, representatives of mills located in Michigan, Ohio, Wisconsin, Indiana, and Illinois. The two previous gatherings have been well attended and the efforts of the Kalamazoo Valley division have been highly commended for staging such gatherings.

There were two speakers at the Kalamazoo Valley dinner session. Harry A. Harvey of the Sutherland Paper Company spoke on "Auto Board." Arthur Fitzgerald of the Kalamazoo Vegetable Parchment Company took for his subject "Planning purchases for a paper mill."

The Sutherland Paper Company held its annual meeting Monday afternoon, February 3rd, at the Chamber of Commerce rooms. Reports were satisfactory, with a large amount of business booked for 1930.

The annual election was perfunctory, the only change in the directorate, being the election of Charles H. Farrell to fill the vacancy caused by the death of the late James H. Dewing.

Harry C. Bradford, secretary of the Rex Paper Company, has been appointed to serve as arbitrator in local commercial disputes, which are submitted to arbitration under the rules of the American Arbitration Association. In addition to Bradford, others in the Kalamazoo panel are: Charles S. Campbell, Claude S. Carney, Fred R. Dowsett, Frank F. Ford, R. A. Hayward, F. M. Hodge, George P. Hopkins, Harry C. Howard,

Corrugated Bars

SWW Corrugated Bars are stronger—tho lighter in weight—provide more beating surface, with no increase in power, and last much longer than ordinary bars. Thickness of edge remains the same throughout the life of the bar. Adaptable to any type beater.

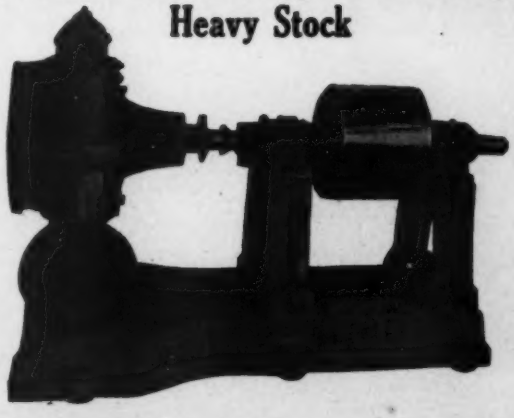
Roll Bar Grinder

For grinding or truing bars, while in the roll—prevents loose bars and rings and saves the wood filling. Write for list of SWW paper mill devices.

Simonds Worden White Co.,
Main Office, Dayton, Ohio

SIMONDS WORDEN WHITE

8" Horizontally Split Casing Single Suction Belted Pump for Handling Heavy Stock



Built in sizes ranging from 2" to 18". 42 years designing and building centrifugal pumps for all conditions and service. Our engineering staff is ever at your service.
Please submit your specifications.

LAWRENCE MACHINE & PUMP CO.
LAWRENCE, MASS.

Manufacturer of "Lawrence" Pump, Centrifugal Pumping Machinery, Vertical Steam Engines, Contractors for Special Machinery

TWENTY-FIVE YEARS

of Service have made Leaders of

LINDSAY WIRES

OUR SPIRAL WEAVE FOURDRINIER WIRES lengthen the life of wires by preventing the grooving of seams.

OUR LONGCRIMP WIRES give 30 to 50% longer service than regular meshes.

Cylinder wires in Brass and Phosphor Bronze for all sizes of Cylinder machines.

THE LINDSAY WIRE WEAVING CO.

Collinwood Station CLEVELAND, OHIO

George T. Jibb, W. L. Otis, Duncan Rice, Louis Rosenbaum, J. Charles Ross, William Shakespeare, Jr., and L. C. Wright. Michigan has 44 such panels. A speedy, inexpensive and amicable method of settling commercial controversies is offered through the medium of this organization.

Mr. and Mrs. Kindleberger Visiting Orient

Jacob Kindleberger, president of the Kalamazoo Vegetable Parchment Company, is visiting the Holy Land, a trip he has planned for 40 years. He left Kalamazoo, February 3, accompanied by Mrs. Kindleberger. The privilege of a three months' leave of absence was extended him by the board of directors.

Mr. and Mrs. Kindleberger will visit the Mediterranean countries devoting special attention to Palestine. Before leaving Kalamazoo, Mr. Kindleberger received by mail an invitation to speak in the American church in Jerusalem.

On the return trip home, their travels will take them to Italy, France, Holland, England, and Scotland. Mr. Kindleberger intends to visit the handmade paper mills in Italy, and mills in England and Scotland. Mr. and Mrs. Kindleberger will return home about May 1.

K. V. P. Mill Sets Record in 1929

The year 1929 was the best the Kalamazoo Vegetable Parchment Company has enjoyed since the close of the World War. That fact was brought out at the annual meeting of stockholders, January 28th, in the Parchment Community House. The outlook for 1930 is equally favorable.

The new parchmentizing division, erected by the O. F.Miller Company, all steel, brick, and concrete, is a model of its kind. It is equipped with four high speed parchmentizing machines, increasing the possible output in that unit fully 100 per cent. During the last half dozen years K. V. P. has expended over $5,000,000 in betterments and the plant today is generally reputed to be one of the finest of its kind in the world.

Demand for Mulch Paper

A large tonnage of mulch paper will be used by Michigan gardeners this year, extension workers report. One firm in Western Michigan has taken orders for a carload. The paper was used with variable results by many farmers last year, and their reports have served to stimulate the demand for the product. State experiment stations conducted various tests. Reports from the Ohio station indicate good results were obtained.

The tests proved the value of mulch paper as a protective covering for the garden both in increasing the natural temperature of the soil and in providing a uniform distribution of moisture. Increased production ranging as high as 92 per cent was recorded for the gardens using the paper covering.

Irish Retires as Director of Bryant Co.

An outstanding feature of the annual meeting of the Bryant Paper Company held February 8th, at the offices of the company, was the retirement of Col. E. M. Irish as a director. Mr. Irish prepared the original incorporation papers of this concern in 1894 and has since that date been the corporation's legal adviser and counsel. Advancing years and poor health caused him to announce that he could no longer serve in that capacity. Frank E. McAllister, president of the Kalamazoo Railway Supply Company and a director in the Home Savings bank, was named to fill the vacancy.

At the same time the stockholders increased the board from 10 to 12 in number and elected as new directors, W. J. Lawrence, of Kalamazoo and Dr. Rudolph Gilkey of Plainwell.

Over 400,000 of the 500,000 shares of common stock outstanding were represented at the meeting. The annual report, recently submitted to the stockholders by President Felix Pagenstecher, was considered and commented on favorably. Dr. L. H. S. DeWitt offered a resolution approving of the progress made in improving the plant and commending the efforts of the officers and directors which has made this progress possible "under adverse and discouraging conditions

APMEW EQUIPMENT RETURNS ITS COST EVERY FEW MONTHS TO MANY USERS

Would your Company like to have it produce similar earnings in your mill?

See PAPER AND PULP MILL CATALOGUE page 306 for our catalogue and WRITE FOR INFORMATION.

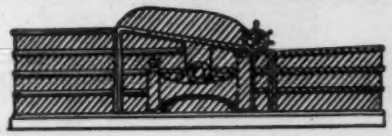
APMEW Pulp Screens
" Paper Machine Screens
" Fine Screens
" Continuous Filters, Pulp Washers, Thickeners and Save-Alls.
" Rotary Sulphur Burners
" Centrifugal Stock Pumps

American Paper Machinery and Engineering Works
GLENS FALLS, NEW YORK

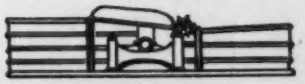
Canadian Manufacturer—Paper Mill Equipment, Ltd., 413 Drummond Building, Montreal, Que.
Pacific Coast Representative, K. B. Hall, Portland, Oregon

When *One* Dayton Beater Is Installed

IT'S SAFE TO PREDICT JUST WHAT WILL HAPPEN



You'll find few, if any, single Dayton High Speed Beaters in any mill; but whole rows of them are common, for their popularity increases. One firm alone is now using 40 Daytons.



There are many reasons for their multiplicity. Some are—less power, a heavier furnish, faster beating, less jordaning—but let us tell the story complete as applied to *your own* beating room problems.

The Dayton Beater & Hoist Co.,
Dayton, Ohio

Western Representative F. H. Godfrey, 415 Lenora St., Seattle, Wash.
Eastern Representative Mansfield, Bolton & Kent, 501 Fifth Ave., New York

DAYTON High Speed Beaters

A. P. W.

PAPER COMPANY

Albany, New York

A. P. W. Paper Mill, Albany, N. Y.

A. P. W. Pulp Mill, Nova Scotia, Canada

A. P. W. Converting Plant, Albany, N. Y.

Makers of TOILET PAPER, PAPER TOWELS, GROUND WOOD PULP

over which they had no control." This resolution was adopted unanimously.

A. W. Cole, superintendent of the Rex Paper Co., Kalamazoo and Henry G. Nendorf, Kalamazoo, have been awarded a patent on a paper coating machine, according to advices received from Washington, D. C.

Awarded Compensation

A compensation award which at the maximum would amount to more than $10,000 has been awarded to Kenneth Huddleston by Deputy Commissioner Silas MacGregor of the state industrial accident commission in deciding Huddleston's claim for compensation against the Kalamazoo Paper Company.

By terms of the award, Huddleston is allowed $1,179, as compensation for total disability up to the date of the hearing. From that time on, he will receive $18 a week compensation during his period of total disability, not to exceed 500 weeks. Compensation is to stop when he is fully recovered from his disability, or at the end of 500 weeks, if he has not recovered his health at the expiration of that time.

The Michigan Division of the American Pulp and Paper Mill Superintendents Association held its regular monthly meeting on February 20th at the Columbia hotel. M. J. Mackay of the Kalamazoo Wire Works was the speaker of the evening and his subject was "Rolled Wires."

Gratifying improvement in business at the Bryant Paper Company is indicated in the 1929 report just issued to the stockholders. Profits for the last year, before federal income tax, are $193,321.54. Of this amount, $120,893.49 is credited to the fourth quarter. There was a loss of $15,125.81 for the first quarter. The condensed statement shows assets are $2,999,022.06 as against $500,104.11 quick liabilities, a ratio of approximately 6 to 1. Bryant Paper owns capital stock in other concerns valued at $1,260,500. Buildings, machinery and equipment (after depreciation) are valued at $4,679,204.65. There is a bonded indebtedness outstanding of $2,028,200.

❖ PACIFIC COAST ❖

WASHINGTON

New Converting Plant of Crown-Willamette

The Crown-Willamette Paper Company will have produced by March 1 in its new converting mill at Camas, 1,000,000 rolls of bathroom tissue, a new product of manufacture in the northwest. Co-incident with the distribution of this output to jobbers and retailers a large national advertising campaign is to get under way, for which this first shipment constitutes the initial quantity. Two brands of bathroom tissue are to be manufactured in the Camas converting plant and general distribution will be made through the National Paper Products company, a subsidiary of the Crown-Zellerbach corporation. Fifteen tons of the tissue are being made daily but this output is soon to be doubled when all the machinery has been put into operation.

The new converting plant occupies a building 200x250 and is credited with being the most modern and best equipped converting plant in the United States. A complete system of conveyors moves the product from one part of the plant to the other without trucking. Filled cartons are taken from the operating room to warehouse or railroad siding for storage or loading, while empty cartons are taken on conveyors to the packers over another system. A spur track alongside the plant provides easy loading facilities. Paper from the mill will be brought to the converting plant on electric trucks operating through a tunnel under railroad tracks and delivered to the winding machines by a monorail system.

Seven machines are already installed in the new plant and five more are still to be added to complete the roll battery. Package machines for flat bathroom tissue will probably num-

DISTINCTIVE DESIGN
EXACTING WORKMANSHIP
QUALITY MATERIALS

Fig. 460
N.R.S. "Pilot"
Gate Valve

BECAUSE trouble-free valve performance depends on design, workmanship, and materials, The Wm. Powell Co. has carefully considered these elements.

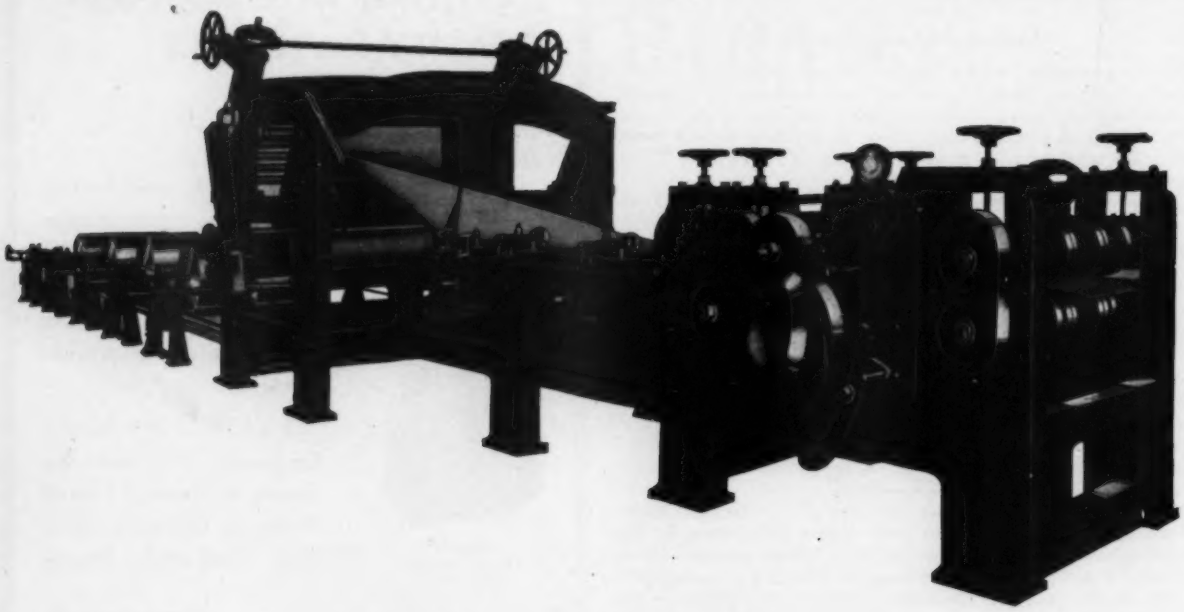
Let Powell Service Engineers give you the details of merit of Powell Products. Let them prove that Distinctive Design provides for the ever changing demand created through new processes, higher pressures and temperatures — Exacting Workmanship consists of the accurate testing and inspection — whereas Quality Materials account for the long life of Powell Valves.

Fig. 478
O.S.&Y. "Pilot"
Gate Valve

THE WM. POWELL CO.
2521-31 SPRING GROVE AVE.
CINCINNATI, OHIO

POWELL VALVES

PAPER BAG MACHINERY



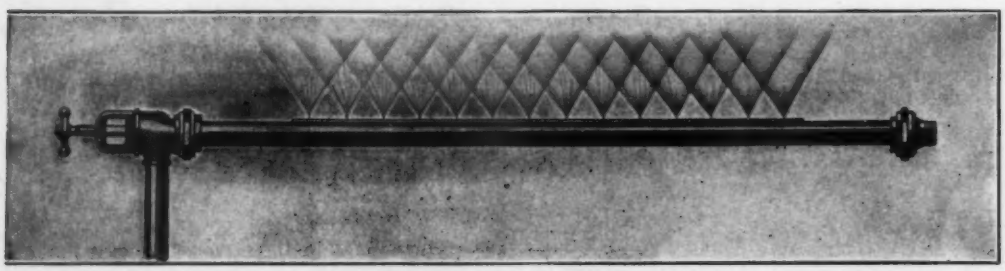
Multi Wall Tuber

For production of sewn bags, with intucked sides, with one up to five walls in thickness.

Modern in construction. All bearings of ball or roller type, entirely enclosed.

The tubes made on the Multi Wall Tuber meet the severest tests of perfection and production.

Write for further information—no obligation.



The Rain Storm Shower Pipe

The Smith & Winchester Mfg. Co.

ESTABLISHED 1845

South Windham, Conn.

PAPER MACHINERY — PAPER CUTTERS — PAPER BAG MACHINERY

ber twenty or more and 10 paper towel machines are also included in immediate plans for new equipment.

The Pacific Straw Paper & Board company which has been improving its plant on the Cowlitz river near Longview, is still working on installations of equipment. A 500-power motor is being installed to operate a wood grinder in the wood mill erected a few months ago.

Savage, Johnson & Cooper, Inc., brokerage firm of Seattle, are reported to be behind the financing of the pulp and paper project which has been anticipated for sometime at Palouse. H. D. Wagon, a member of the board of directors of a company being formed, is said to be the inventor of a process to make pulp from wheat straw, and it is this process which will be used in the proposed mill. Well drilling is to start at once on the site and it is announced that construction will start soon.

Clarence G. Blagen is head of a group of men who will sponsor a pulp mill project at Hoquiam if the water bond issue goes through at the election on March 8 assuring an abundant supply of water for large industrial purposes. Speaking on behalf of Mr. Blagen before the local chamber of commerce February 7, P. J. Mourant said that although Mr. Blagen was ready to furnish raw material and power for the operation of such a plant the whole matter rests on the water possibilities. If the city votes to finance the water system the proposed plant will get under construction very shortly.

Albertson & Cornell, contractors, have started construction on the sawmill unit of the Puget Sound Pulp & Paper company's plant at Everett which unit will cost about $20,000.

R. S. Wertheimer, chairman of the committee on arrangements for the spring meeting of the Pacific Coast Division of T.A.P.P.I., which is to be held in Longview, April 5, is getting preparations under way, with the help of H. K. Benson of Seattle, and local co-operation in Longview. A fine attendance is anticipated by those in charge.

OREGON

Carter Rice Portland Office Wins Trophy

The Portland office of Carter, Rice & Co., won the silver trophy in a national sales contest which started January 1, 1929, and ended December 31 of that year, with branches of the company all over the country competing. Credit goes to James W. Murphy, manager of the Portland office, and his sales force, for the honor brought to the west coast.

On February 20 a banquet was held celebrating the event, at which Chas. H. Beckwith, Pacific coast manager of the company was honor guest. According to Mr. Murphy this is the first time this contest has been featured, but it will now be continued, with the trophy to be offered each year and the name of the winning office inscribed thereon. Any office which wins the trophy three times, not necessarily in succession, will be awarded it permanently.

Suits filed against the Hawley Pulp & Paper Company, Oregon City, and the St. Helens Pulp & Paper Company, St. Helens, by attorneys for the Guardian Trust Company of Cleveland, Ohio, and the Paper & Textile Machinery Company of Sandusky, Ohio, charging infringement of patent rights, were ordered dismissed without prejudice by Federal Judge Bean upon a motion for dismissal by Arthur L. Veazie, attorney for the plaintiffs, February 18. It was understood that these suits were only two of several filed throughout the country and that instructions for dismissal came from the east. The suits were filed February 21, 1929.

The Bingham Pump Company of Portland has received the contract for all the pumps to be installed in the new plant of the Puget Sound Pulp & Timber Company at Everett, which is being constructed at a cost of $4,000,000. The Bingham

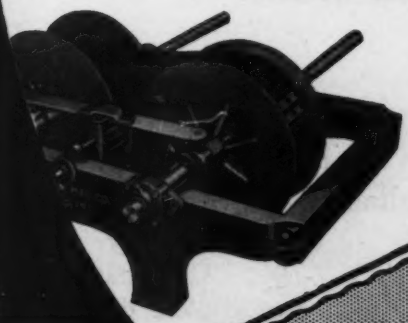
WE want you to have the benefit of every value we have built into the LEWELLEN Transmission. To this end we hope to get a copy of our new Service Manual into the hands of every LEWELLEN operator.

But it is impossible for us to know all LEWELLEN owners, therefore, we take this space in order to reach you.

If you use a LEWELLEN Transmission, please fill out the coupon below, giving the name of the employee whom you wish to have this Service Manual. We will then forward the Manual by return mail, without any charge.

It will also help us improve our records, if you will give us the serial number of the LEWELLEN Transmissions in your plant.

Lewellen Manufacturing Co.
Columbus, Indiana



Gentlemen:
Please send me your Service Manual. We use Lewellen Transmission.

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Company has added enough extra men to assure delivery of the pumps within ninety days. The capacity of the pumps, which are of centrifugal type, has been estimated at 90 million gallons per day, one pump alone being able to furnish 1,500 gallons a minute. A new feature of the equipment is the non-clogging paper stock pumps recently devised.

The Tuttle Press Co., converters and printers of paper, has selected Portland as the distributing point for Pacific northwest territory, after an extensive survey of the marketing conditions of the district. A large warehouse stock has been stored at 200-208 Oak street, the location of the Rapid Transfer and Warehouse Company.

B. T. McBain, consulting engineer of Portland, is making an eastern trip. At last reports he was in New York.

CALIFORNIA

Crown-Zellerbach Markets New Bathroom Tissues

Zee and Zalo will be marketed by the National Paper Products Company, a division of the Crown-Zellerbach Corporation. They will be distributed through the regular jobber and wholesale channels.

A new process recently perfected in the manufacture of bathroom tissue, which makes for greater softness and absorbency is being introduced to the general public for the first time this month. The successful results of the new process have been incorporated in the two new bathroom tissues, Zee and Zalo. Crown-Zellerbach Corporation, largest paper manufacturing concern on the Pacific Coast, and second largest in the United States, is the manufacturer. The company is introducing Zee and Zalo with an extensive national advertising campaign.

Production on both new brands has been under way for sometime at the Camas mills, Washington, for distribution to Western States and at the corporation's enlarged mill at Carthage, New York, for Eastern distribution.

The program committee for the convention of the Pacific States Paper Trade Association to be held in Del Monte May 15-17 is now making preparations for this big event, according to George I. Tompkins, Los Angeles, chairman of the committee. He is being assisted by L. A. Colton and H. S. Bonestell of San Francisco, and B. G. Ewing of Spokane. This year will also witness the 12th annual golf tournament which in itself is an event to be anticipated with enthusiasm, according to those in charge.

B. F. Myers, recently of the Seattle office of Zellerbach Paper Company, is now located in San Francisco as general credit manager for all divisions of the company.

Augustus Johnson, San Francisco, and A. A. Ernest, Los Angeles, both representatives in their respective territories for the Everett Pulp & Paper Company, have been on a trip to the northwest plant of the company.

S. W. Sweet, representing the Pacific Straw Paper & Board Company of Longview, Wash., is now located in San Francisco.

The Bristol Co., Waterbury, Conn., has recently opened a new sales and service office in Los Angeles. S. W. Case has been appointed district manager and W. H. Rogers, sales and service engineer. Both of these men are capable engineers and have a background of several years' experience in the use of recording, indicating and control instruments, particularly as applied to industrial applications.

By a recent decision of the United States board of tax appeals, the Treasury Department has cancelled an assessment of $139,607 against the Crown-Willamette Paper Co., San Francisco.

Crown-Zellerbach Corp. has just issued $10,000,000 ten-year 6 per cent gold debentures. Each $1,000 debenture of this issue will be accompanied by a common stock purchase war-

MARIS SIMPLIFIED ELECTRIC HOIST

MAINTENANCE the true test of QUALITY

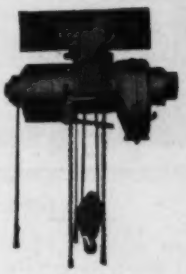

Fig. 259

Fifteen of these 2 ton Hoists have been serving a railroad car shop for several years with only minor repairs. If you have a hard job and want 365 days per year of uninterrupted service send us your inquiry. Maris engineers are always ready to help solve your material handling problems.

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Which absolutely control the drying of the sheet. Installed on sixty days' trial

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At AUSTIN, PENNA.—The Bayless Mfg. Corp.'s complete, up-to-date Paper Mill at fraction of its actual value.

At CHEBOYGAN, MICHIGAN, the Paper Mill of the Union Bag and Paper Corp., at a very low price. Exceptional water power contract offered by the Michigan Power Co.

At BUCK RUN, PENNA.—The Coatsville Paper Mills, Inc. 86" trim three cylinder machine. Good specialty mill, ready to operate.

For further particulars address

GIBBS-BROWER COMPANY, Inc.
Paper and Pulp Mill Brokers
261 Broadway, New York City
OUR MOTTO—"Service First"

WANTED—One duster for old paper stock to handle 100 tons mixed per day. Address Box 174, The Paper Industry.

POSITION WANTED—Accountant with 15 years experience in Pulp & Paper Mill accounting, including cost and general accounting, organizing of accounts, etc., qualified to take full charge of accounts if required. Address R. G. Wilde, 124 Chester Ave., Toronto, Ont.

It Pays to Advertise Opportunities in this Opportunity Section

Roeper Electric Hoists

For lifting paper rolls, removing calender rolls or raising Fourdrinier wires, use ROEPER Type "R" Electric Hoists—With or without Trolleys—Speeds up to 40 feet per minute—Send for Bulletins.

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Lessons in Paper Making

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One of the greatest funds of information on paper making ever published for the mill man.

Part I contains the first twelve lessons and two separate articles—A Problem in Head Box Control and The Degree of Hydration.

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A 48-page pamphlet made up of practical helps, many of which have meant considerable savings in paper and pulp mills. Of tremendous value to the practical man. Price 50c.

THE PAPER INDUSTRY
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rant entitling the holder to purchase 20 shares (10 shares in the case of $500 denomination gold debentures) common stock (voting trust certificates) at a price of $20 per share if exercised on or before September 1, 1931. The proceeds from the issuance of these gold debentures will be used to reimburse the corporation for capital expenditures heretofore made, to provide funds for plant additions and betterments, and for other corporate purposes.

The Foxboro Co., Foxboro, Mass., announces the removal of its Los Angeles office to 2307 East Eighth Street.

IDAHO

Plans Developing for Priest River Mill

A new mill for the Pacific States Pulp & Paper Company which has been under consideration for sometime will probably be built at Priest River, with the announcement late last month that $2,500,000 of eastern capital will be available. A. T. Peterson, executive vice president of the company will go east from his home in Spokane to close negotiations said to be pending for the construction of a sulphate pulp mill to cost $1,500,000.

In preparation for this project the Pacific States Pulp & Paper Company early this year secured the controlling interest in the Naso Chemical company which owns or has contracts covering 11 sodium sulphate lakes near Okanogan, Wash. As soon as weather permits, engineers will select a site for a dehydrating plant near these lakes which will have a 100 ton daily capacity, the output to be shipped to the Priest River plant which will be the first kraft pulp mill in the state. The sodium sulphate will be transported in solution by a pipe line from the lakes to the dehydrating plant.

Mr. Peterson is expected to make all arrangement for machinery for the new plant while in the east when he closes financial negotiations.

The proposed Priest River plant will have a capacity of 100 tons of sulphate pulp daily, and this output has been contracted for over a period of ten years by the Pulp & Paper Trading Company of New York at the market less 4 per cent sales cost.

ALASKA

Senate Gets Bill to Investigate Wood Pulp Production

Asking for all available information concerning the possible production of wood pulp in Alaska for use in manufacturing newsprint, a resolution was introduced into the Senate February 14 by Senator McKellar of Tennessee. The resolution asked that the secretaries of interior and commerce furnish the Senate with facts on the subject.

Senator McKellar said it was essential as a matter of public interest that newsprint should be plentiful enough to supply American newspapers and that he had been informed that the flow had been menaced by a reported combination of Canadian newsprint manufacturers to fix prices. The government already has built a railroad into Alaska and this with water routes should permit of transportation activities at a reasonable rate, it was pointed out.

Commenting on the proposed resolution, paper officials in the Northwest and railroad companies state that little difficulty need be experienced in moving the wood or the finished product from Alaska to the United States, and that a survey last summer made by airplane revealed an immense supply of pulp timber available.

The annual meeting of the American Forestry Association, the oldest organization in the country having to do with the perpetuation of the nation's forests, will be held in Minneapolis, Minn., April 29 and 30 and May 1. The Federal Government, various state governments and the outstanding forestry and conservation organizations in the country will be represented, as will the Canadian Government.

Reduces felt replacement costs

WASHING felts with strong alkalies and similar materials is certain to injure the fibres . . . shorten the life of the felts.

You can get longer service from felts and reduce replacement costs appreciably, by washing your felts with Oakite. This effective material cleans *safely*, removes every particle of dirt, sizing and other foreign matter without harming fibres in the least. It rinses quickly and completely, leaving felts soft and as absorbent as new.

Our nearby Service Man will gladly call at your plant and show you how easily, quickly and thoroughly felts are washed the Oakite way. Just drop us a line. No obligation.

Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the United States and Canada

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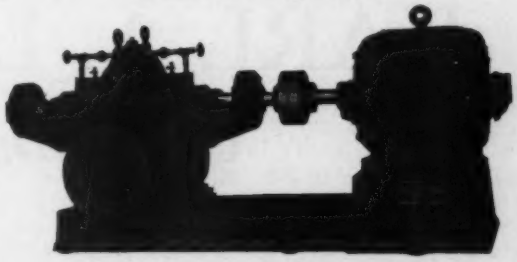
"VORTEX" CENTRIFUGAL **PUMPS**
"Built for every service"



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In every type of service—water works, filtration plants, construction work, irrigation, dredging, sewage, etc.—you will find LAWRENCE "VORTEX" Centrifugal Pumps giving thoroughly satisfactory service. Continuous operation over long periods of time without repair cost is an outstanding feature.

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New Catalogues, Books and Publications

American Engineering Co., Philadephia, Pa.—A new catalogue on Taylor Stokers has just been published. The book contains a complete description of all types of Taylor Stokers, stoker drives and ash discharge mechanisms. Construction, operation, theory of combustion, typical operating results are included and there are a number of fine illustrations in colors.

American Hoist & Derrick Co., St. Paul, Minn.—This company has issued a very attractive booklet illustrating its different types of shovels and derricks. The illustrations are most unusual, being produced by color plates on black, and representing an exceptional piece of printing.

L. L. Brown Paper Co., Adams, Mass.—An attractive portfolio of specimens has been issued by this company in connection with the new line of certified record papers. The portfolio is of letterhead size and exhibits ruled and printed specimens of several grades of guaranteed record papers, also includes appropriately selected samples of letterheads in its bond lines. Copies on request.

Brown Instrument Co., Philadelphia, Pa.—This company's latest publication, catalogue No. 7501 presents very interesting information on Brown Remote Type Instruments for measuring pressures, liquid levels, flows and for indicating positions. The book has 32 pages and is printed in two colors. The operation of the various instruments is explained in detail. There are sectional views and wiring diagrams amplify the descriptive matter. Copies on request.

Cutler-Hammer, Inc., Milwaukee, Wis.—"Practical Pointers on the Selection of Motor Control" is an educational booklet which stresses in particular the features to consider when selecting motor control. It tells how to choose control to suit the motor's load and how to select control for direct current motors and alternating current motors. It is written by an electrical engineer in a practical and entirely unbiased manner, and is well illustrated. Copies on request.

Elliott Service Co., 242 West 55th St., New York City—This company, well-known specialists in foremanship development, industrial education and personnel control, has compiled an interesting and valuable chart on "How and Where to Cut Waste." This chart lists 64 points where interest and co-operation of personnel can help cut down unnecessary waste which is causing a yearly loss of thousands of dollars. Copies are available to industrial executives for use in personnel work.

Goulds Pumps, Inc., Seneca Falls, N. Y.—This company has just issued the first of a series of bulletins, which will eventually cover the entire line of Goulds Single and Multi-Stage Centrifugal Pumps. This first publication is bulletin No. 200 "Centrifugal Pump Selection Charts." The charts given show the extremely wide range of capacities and heads covered by these pumps and will prove invaluable to any one selecting a centrifugal pump for any condition. Specifications are given on Goulds horizontally-split, enclosed-impeller, single-stage, double-suction pumps and there are a number of diagrammatic illustrations.

This company has also issued "Pump-Fax" which is a handbook on pumping. This handbook contains data and information on the characteristics, installation and operation of pumps which will be helpful to pump engineers, or to any man who has the problem of moving liquids of any kind.

A. C. Nielsen Co., 4450 Ravenswood Ave., Chicago—Nielsen Survey No. 800. Slitter and Winder on Chip Board. Cutters are in their eighth year of service. Two slitting and winding machines of the shear-cut are operated at a Pennsylvania chip board and building paper mill. Almost negligible repair expense during seven years caused the installation of a second of the same make. Rolls are invariably square edged, firm and free from dust. Annual costs for cutter and general maintenance is $69.00 a year.

These surveys are ordinarily available only to Nielsen Survey index subscribers, but by special arrangement a complimentary copy will be sent to any user of such equipment who will write directly to the company asking for surveys by number and mentioning THE PAPER INDUSTRY.

Schutte & Koerting Co., Philadelphia, Pa.—This company has just issued a new and completely revised edition of its bulletin 3-A describing the S & K line of steam jet heaters for the simple and convenient method of heating water or other liquids by the use of steam introduced directly into the liquid. Capacity charts, price lists, dimension tables and installation diagrams covering these heaters are included.

The Sherman Corporation, 292 Madison Ave., New York City—This company, well-known industrial, management and sales engineers, has just sent No. 3 of a series of cast studies of typical business problems. The story, written in the form of a business scenario, is a digest of the business problems of a father and two sons who owned a good legitimate business; how a specialist was called in and analyzed and reorganized the business; finally, how the operation of the plan brought larger volume and reduced costs, the business being strengthened so that the father found it possible to retire, turning over the management to his sons. This scenario is accompanied by a blue print of the plan used in this particular case.

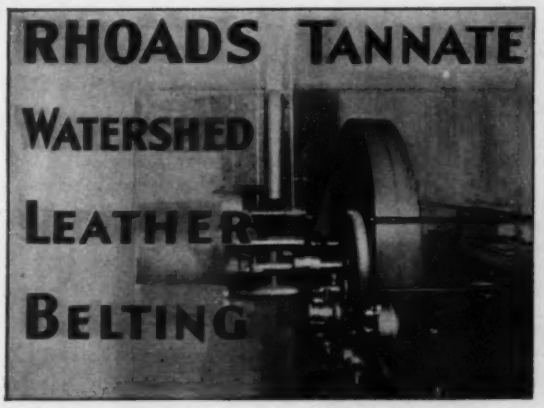
Swenson Evaporator Company, Harvey, Ill.—"Theory of Industrial Crystallization' which is Article IX of the series on Heat Transfer and Crystallization by Dr. W. L. McCabe has just been received. The bulletins of this series have attracted considerable attention and have been used for advanced classes in chemical engineering in universities and technical schools. The Swenson Company advises that a limited supply of the eight previous bulletins are available for distribution.

Heating and Ventilating Exposition Successful

The first International Heating and Ventilating Exposition, held January 27 to 31 in the exhibition hall of the Philadelphia Commercial Museum has been voted a complete success, and no matter how many more similar affairs are held, this first showing of the combined industry will have left an indelible impression.

Representatives and products of about 300 manufacturers were assembled at the exposition, which was directed by the International Exposition Company of New York, and held under the auspices of the American Society of Heating and Ventilating Engineers, which held its 36th annual meeting simultaneously with the exposition.

The 1930 Willard Gibbs gold medal of the Chicago section of the American Chemical Society has been awarded to Dr. Irving Langmuir, associate director of the research department of General Electric Company.



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THIS drive killed five rubber belts in quick succession, two of them within three weeks! A 16" double Tannate was then installed and all fight was taken out of the drive. Not only that, but the job is being done in a very satisfactory manner. The belt operates eight centrifugal pumps, eight vacuum pumps, and eight screens, in a paper plant. Such a fluctuating load brings out the fine qualities of Tannate.

Tannate has at least 25% greater pulling power than the "very best" oak-tanned belts. Tannate's grip on the pulleys is conspicuous. Tannate is *made water-proof*, and will carry nearly the same load *under water* as in normal conditions.

On a wide range of drives Tannate, though more expensive initially, will prove a wise investment in that it transmits the maximum power at low belt tension, and on hard drives frequently outwears oak belts several times.

For difficult drives, like this one—Tannate is particularly profitable.

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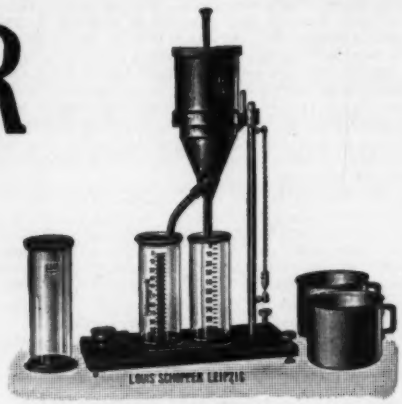
All Kinds of Scales



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Uniformity of beating means better paper.

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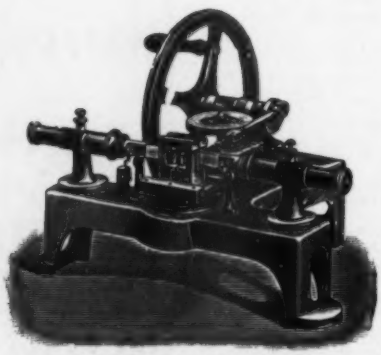
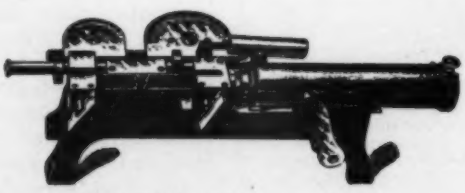
Carried in stock—1/1000 of an inch for Boards, 1/2000 of an inch for Paper.



Schopper Folding Tester
The folding test has become standard for bonds, ledgers, and Kraft papers.

Schopper Strength and Stretch Tester

Small Piece Pocket Paper Scale
By weighing a piece 2 in. by 4 in., gives basis weight 25x38, 24x36, 22x34, 500 sheets.



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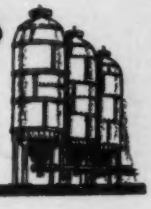
Technical Developments in the Paper Industry



Domestic and Foreign

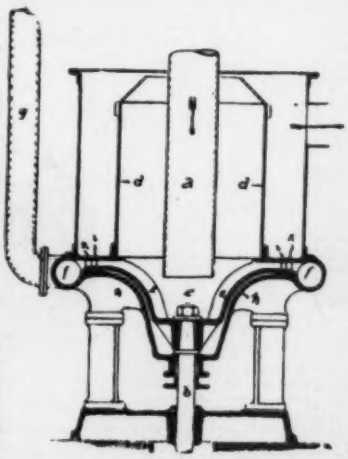
The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Warping of Paper

A SERIES of experiments were made on the warping of paper. The results showed that the cause of warping is an unsuitable degree of dryness or of humidity when the paper passes between the drying rolls. Suitable drying is prejudiced by the paper moving too slowly or too quickly over the heating surface. This period of movement, as also the best uniform temperature of the rolls, have a great influence on the evenness of the paper and hence must be previously accurately fixed. The warping of paper is not ascribable to the work of drying alone, but to the irregular temperature during drying, which produces a variable discharge of humidity from the paper whatever may be its quality. An increase of the heating surface can give better results for the quality of the paper, owing to a more uniform utilization of the heat and possible employment of low pressure steam. A fall of temperature producing warping may occur at the end of drying. This can be prevented by a final passage over tepid rolls or rolls subjected to the action of a current of air at a moderate temperature. O. Kuck, Chimie et Industrie, through The World's Paper Trade Review, 1929, 2016.

Vertical Screen for Wood Pulp

IT often happens in screens of the ordinary type used in the paper mill that the knots and lumps that are present in the pulp, which is being screened, remain in the screen cylinder during the process and are constantly thrown against the walls of the cylinder with the result that the knots are broken up into fibers. These fine splinters pass through the screen and are thereafter present as impurities in the screened pulp. Furthermore, the constant impact of the hard knots against the screen eventually injures it.



These disadvantages are overcome in the new type of screen which is shown in the accompanying illustration. In this apparatus, the pulp which is being screened is fed from a suitable container under as constant pressure as possible through the inlet pipe (a) into the screen, that is first into the active or moving part of the same. The latter is a bottom section (c) which rotates on the shaft (b) and which is made with blades in a similar manner to a centrifugal pump.

Due to the fact that the inlet pipe (a) extends into the lower section (c) of the screen cylinder (d), the heavier impurities in the pulp are removed by centrifugal force into the collecting pipe (f). The material is removed to a knot catcher where the valuable fibers, mixed with the knots, are recovered. The recovered stock is fed back again through the inlet pipe (a) into the screen. The pipe (g) conveys the separated knots away from the screen.

In order that no more stock than is actually necessary to convey away the knots through (f) and (g) is removed from the screen, the lower portion (h) of the screen is provided with an annular rib (i), which is provided with various openings. A sliding annular disc (k) is provided and this can be adjusted externally on the screen so that the slots or openings in (i) can be made larger or smaller according to the nature of the impurities. German Patent No. 480,393, filed August 12, 1926. Zellstoffabrik Waldhof.

Decomposing Cornstalks by Means of Chlorine

THE cut-up stalks are treated with warm dilute sodium hydroxide solution, then with chlorine, and finally with cold sodium hydroxide solution. At the same temperature the amount of sodium hydroxide used in steeping the material depends on the concentration of the liquor and on the time of treatment. With one-half, one, or two per cent solutions, the reaction is completed in ninety minutes. If equal amounts of material are treated under the same conditions with equal quantities of one or two per cent concentrated sodium hydroxide liquor, the products, after chlorination, consume almost equal amounts of sodium hydroxide, even if the amount of chlorine used is increased eight-fold. The yield obtained depends upon the conditions of steeping and chlorination. With increasing chlorine consumption, the yield decreases quickly at first and then gradually. In all the experiments performed under different conditions, the ash and silica contents of the final products were approximately the same. Loss of lignin increases with increasing chlorine consumption quickly at first, but subsequently reaches an approximately constant value. It is better to use a more concentrated sodium hydroxide solution in the first steeping process, followed by low chlorine consumption, than a dilute solution and high chlorine consumption, since in the former case greater dissolution of lignin results. E. Horvath, Der Papierfabrikant, 1929, volume 27, pages 626-639.

Concentration of Waste Sulphite Liquor

THREE properties of waste sulphite liquor render its concentration difficult. First, there is the tendency of the liquor to foam strongly; second, the evolution of volatile ingredients, which precipitate on the concentrating surfaces, and third, the marked characteristic of the liquor to form hard scale quickly. An attempt is made to overcome these difficulties in a new form of evaporator. The apparatus is of the continuous type and consists of an outer vessel which is provided with the usual equipment, such as openings for watching the contents of the evaporator, manometers, level gauges, sample taking device, etc. The heating system consists of a number of concentrate rings, each of which consisting of two cylindrical metallic jackets, with strengthening rings welded on at the top and bottom. Steam enters these rings. The circulation of the evaporating liquor is very vigorous in this evaporator and hence the evaporating conditions are highly favorable. The walls of the rings are thick and have long life. Local corrosion and pitting, which often cause the failure of the heating coils in evaporators, have not been observed in numerous installations in operation at the present time. The apparatus is also provided with a

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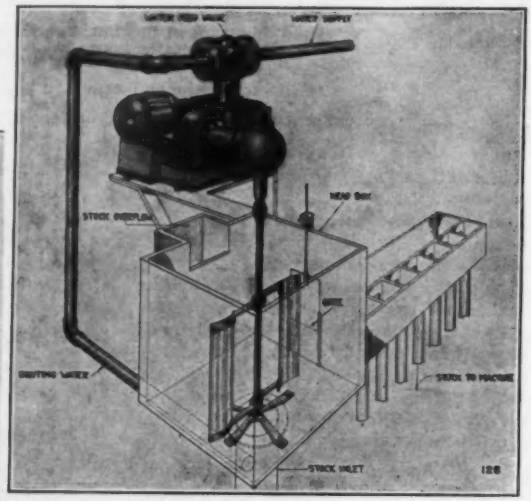
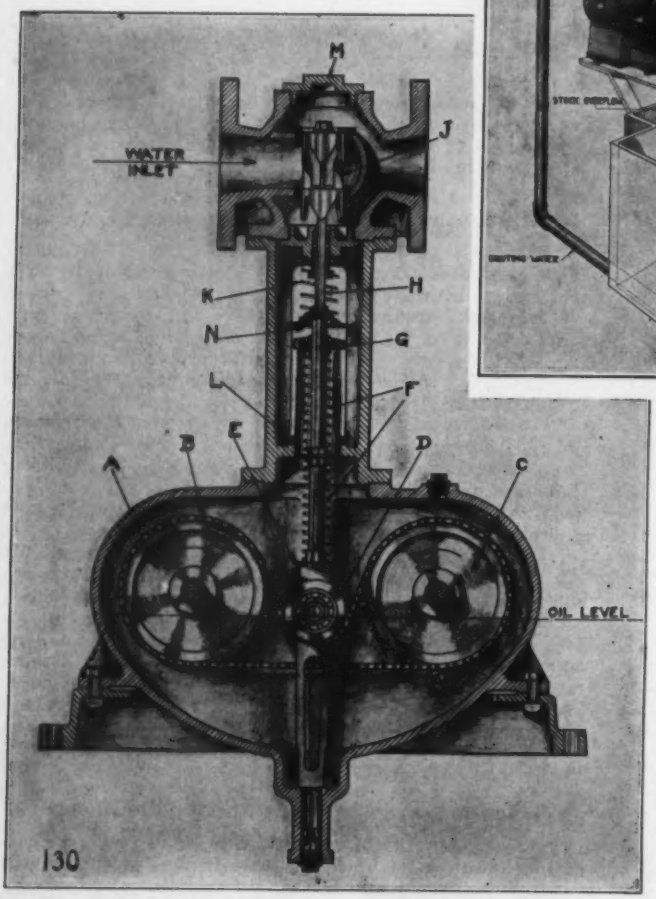
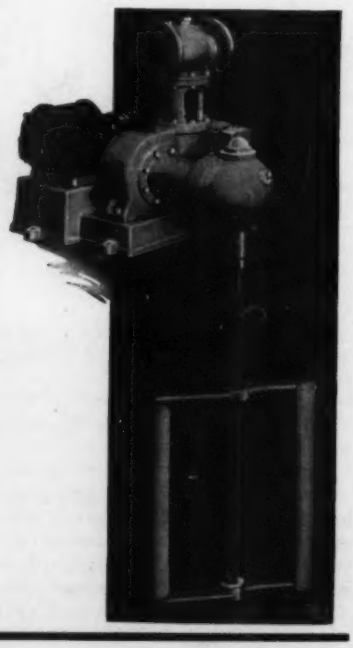




A consistency normal within plus or minus 15/100ths. of one percent is automatically maintained.

THE increasing number of successful installations of this regulator is primarily due to its ability to regulate stock but it is also a self-contained unit that needs no outside preparation for its installation, is exceedingly simple and rugged yet is sensitive to changes of consistency. *Meyers-Mesco regulation* insures constant density, improved caliper, constant moisture content, uniformity of drying conditions, and stimulates uniform action of the entire web forming process.



OPERATION

A revolving agitator, immersed in the stock, is chain driven by a half horse power squirrel cage motor. The varying resistance to rotation of the agitator is directly and instantly transmitted to the water feed valve which admits more or less water to the stock as required. The roller "D," carried in a floating yoke "E" upon the driving side of the chain "B," is free to move up and down against a compression spring "F." The tightness of the chain varies with the resistance of the stock,—the heavier the stock the tighter the chain and the greater the upward movement of the roller and yoke which open the water valve. The thing is exceedingly simple, rugged and reliable yet wonderfully sensitive.

The agitator vigorously attacks the stock, breaking up any lumps and quickly mixing the regulating water.

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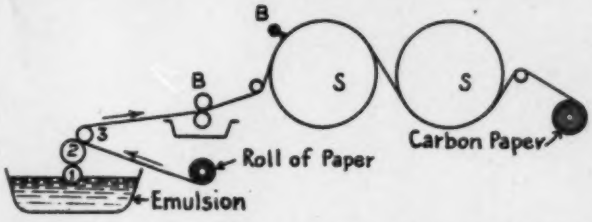
sort of scrubber which has for its purpose the cleansing of the heating surfaces so that they do not become covered with scale. There is also a beater which has for its purpose the prevention of foaming. These two are highly characteristic features of the apparatus. The results obtained as far as efficiency of evaporation and consumption of steam are claimed to be good. Anon. Chemiker Zeitung, 1930, 99.

Manufacture of Carbon Paper

THE required properties of the paper used as a base in this manufacture are described, as well as general manufacturing details. The beating operation carried out on the pulp is a very delicate one for this purpose. It requires a great deal of experience to obtain good results. The most

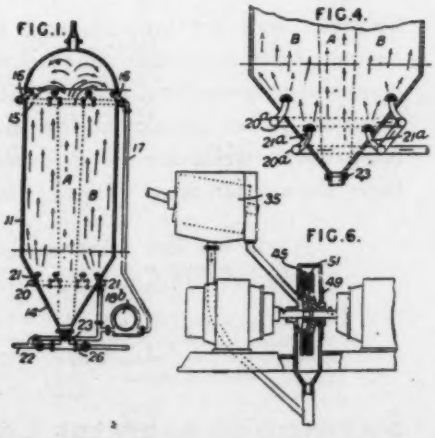


important factor in the refining process is the washing operation in the beaters. The operation should take at least two hours. Examples are given of compositions for use in coating the paper. A composition for obtaining Llue carbon paper contains 200 grams of pure blue, 25 grams of methyl violet, 10 grams of a deep black, 250 grams of alcohol, 8 litres of water and 50 grams of glycerin.

The machine used is shown in the accompanying illustration. Three rollers (1), (2) and (3) are provided for applying the emulsion to the surface of the paper. The paper passes between the rollers (B) which spread the coating evenly over the surface of the paper. The drying cylinders are represented at (B'). J. Oddon, Le Papier, 1929, pages 875-880.

Paper Pulp

IN a process for making paper pulp by digesting wood with liquor and steam, and wherein hot liquor from the top of the digester is injected into the bottom, the steam is injected axially while the liquor is injected in one or more



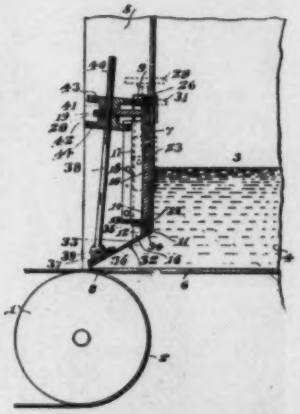
annular zones, between the central axis and the periphery of the digester. The digester (11) in Fig. 1 is provided with header pipes (15) and (20) with inwardly projecting pipes (16) and (21) and connected by the pipe (17) through the pump (18b). The pipe (20) is situated adjacent the conical base (14) at about half the radius. Steam is admitted through pipes (22) and (23), the latter of which with pipe (26) serves as a discharge. In a modification, two rows of pipes (20a), Fig. 4, are provided with staggered outlets (21a). The steam admitted at (23) heats the core (A), while hot liquor is withdrawn at (16) and injected at (21) to heat the annular zone (B). The charge of pulp is undercooked to retain a portion of the lignins, pentosans and sugars, the fibers being then passed through a screen (35). The fibers which do not pass through the latter are treated between discs (45) and (49), which are provided with rubber rings (51). R. W. Horey, The World's Paper Trade Review, 1929, page 976.

New Processes for the Production of Paper Stock from Wood

THE chemical composition of the principal constituents of wood, cellulose and lignin is not yet known. The strength of a paper does not depend on the chemical composition of the stock alone, and it is likewise not determined by the length and thickness of the fibers, for stronger papers are made from shorter fibers than from longer fibers. It is also indicated that, for example, in sulphite digestion a different pulp is obtained in a comparatively short time before the end of digestion, than when the digestion is carried to completion. A different pulp is also formed when the pulp is over-digested. The chemical composition of these pulps differs very slightly. The reasons for this are not known. Various information is given on new sources of paper stock, new processes of digestion, the manufacture of half stuff, etc. Patents are reviewed. A. St. Klein, Angew. Chem., volume 42, pages 430ff.

Slice for Papermaking Machine

THE apparatus consists of a slidable plate (7) at the lower end of which is connected a slice (32) which extends forwards and downwards. Suitable regulating device is provided to control the position of the plate (32), the regulating device being connected at (36). The plate (32) can be adjusted by this device and also maintained at any position. P. J. Lamoureux, Marinette, Wis. United States Patent No. 1,726,440, filed Sept. 1, 1927.



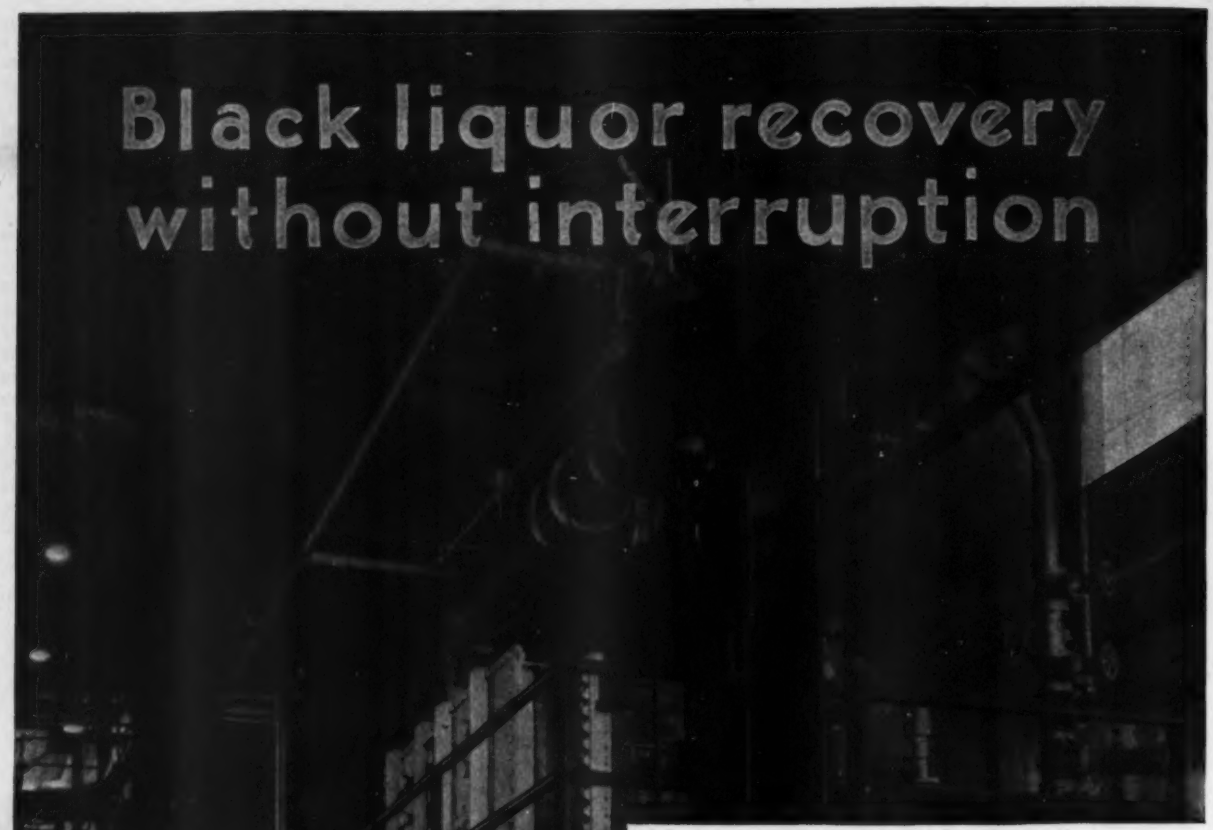
Regulation of Moisture Content of Pulp

THE Anderson moisture measuring device is described. This measures the resistance which an electric current has to overcome in passing through a more or less wet web of the pulp. In contradistinction to earlier apparatus of this general type, the Andersen instrument does not work with metallic contacts cutting into the web but with a contact roller, which is provided with needles or points and which presses into the web. Three or four such rollers are arranged over the width of the web. One of these rollers is active while any of the others may also become active by moving an electric switch. The moisture content of the web is either read off a large scale or it may be continuously and automatically recorded on a suitable chart. Papir Journalen, volume 17, page 137.

Dyeing Paper by Immersion

DIRECT or substantive colors are used in this method, for they will color vegetable materials without the need of using a mordant, which is not generally the case with acid and basic colors. Dyeing by immersion in bath containing direct colors gives shades that are fast to water, and also to light when the proper colors are used.

Tests have shown that it is possible to fix the acid colors by the addition of aluminum acetate in such a manner that they are fast to water. The paper is dyed by immersion. After dyeing, it is pressed and dried. Lakes are formed in



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the dye liquor and it is well-known that there are certain of these lakes, difficultly soluble in water, which are not suitable for dyeing paper, because they cannot penetrate the paper fibers. The amount of aluminum acetate in the bath must be sufficient to impart fastness to the color but not sufficient to cause precipitation of the color in the dye liquor.

Tests have shown that the composition of the liquor should be one liter of the dyestuff in a concentration of ten grams per liter and 0.4 liter of a five per cent solution of aluminum acetate. The latter is prepared by dissolving separately 240 grams of lead acetate and 163 grams of aluminum sulphate, both in a liter of water. The solutions are cooled and mixed together. The precipitated sulphate is filtered off and the filtrate is diluted to two liters by the addition of water. A. Landolt, Le Papier, 1929, pages 1105-6.

Drying Paper and Pulp

A GOOD deal of the water in the pulp and paper web after formation is removed by the press rolls in order to reduce the consumption of heat in the drying cylinders as far as possible. It has been found advantageous to apply

Fig. 1

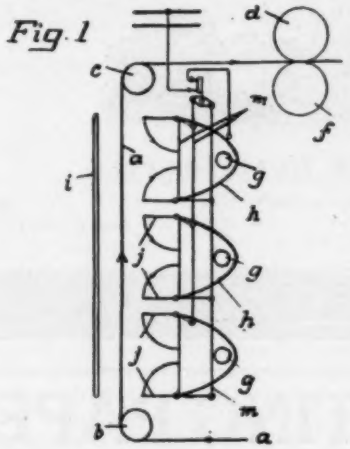
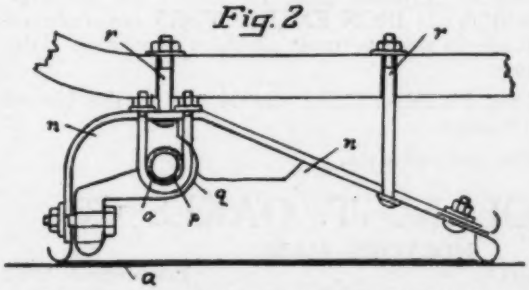


Fig. 2



heat to the paper web as it passes between the press rolls but this cannot be effectively accomplished by actual contact with the hot surface without materially injuring the paper itself. In the new invention this is accomplished by means of radiation from electrically heated elements.

A method of carrying out the invention is shown in Fig. 1. The paper or pulp web (a) enters the wet part of the paper machine in the usual manner and thus contains a very large amount of water. The web passes over the rolls (b) and (c) before passing between the last press rolls (d) (f). Electric heating elements are arranged along one side of the wet web (a), these elements heating the web through radiation of their heat. The heaters consist of cores (g) covered with electric wires heated to incandescence by the passage of the current. These heating elements are preferably arranged over the entire width of the paper or pulp web. Heat reflectors or baffles (h) are also provided. Another reflector (i) is located on the opposite side of the web. This is made in the form of a plate and throws back the heat that passes through the web.

Fig. 2 shows another method of carrying out the invention in which the heating is effected by means of steam. The dome-shaped heating element (n) is arranged over the paper web (a) in such a manner that the edges of the former are as close as possible to the web without actually touching it. Steam is introduced into (n) through the pipe (p) which is provided with openings (o). The dome-shaped heating box (n) is fastened to the framework of the paper machine by means of the bolts (r). A Danninger, H. Schmolka and R. Kastner, Austria. French Patent No. 660,749, filed September 11, 1928.

Electrical Control of Calender Rolls

A NEW way of regulating the pressure in calender rolls is shown in Fig. 1. Although the calender rolls rest one on the other, the pressure due to their weight is not sufficient to finish the paper properly. A weight (1) is therefore placed on each one of the upper bearings, which weight is regulated by means of a worm gear, shown at (2) and (3). The latter is controlled by means of the chain drive and pulley (4). The weight (1) acts on the lever (5). A shaft (6), threaded at both ends and operated by means of the hand-wheel (7), is fixed to the end of the lever (5). The rotation of the shaft (6) causes a change in the distance between the levers (5) and (8). This is necessary for the diameter of the calender rolls decreases due to usage. On the other hand, the shaft (6) allows regulation of the pressure at one or the other end of the calender rolls and thus controls the passage of the paper between them.

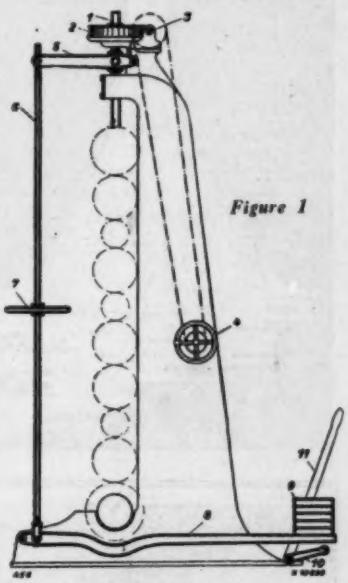


Figure 1

The control effected by means of the pulleys (3) and (4) and the weight (1) serves principally to separate the calender rolls while they are not operating for a period of time and then pushes them together when they are ready to operate again. The pressure exerted by the rolls is therefore under control. This pressure is dependent principally upon the counterweights (9), which rest on a lever (8), connected to the shaft (6). The pressure of the weight (9) on the weight

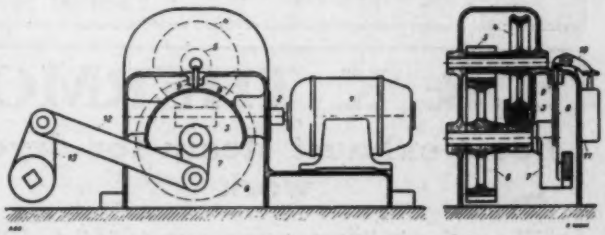
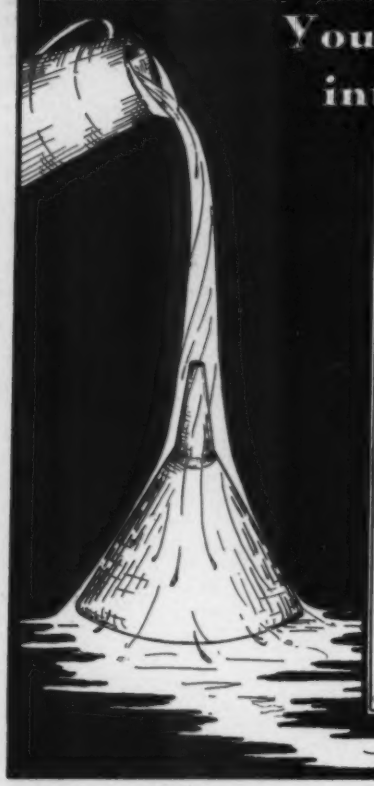


Figure 2

(1) is increased due to the levers (5) and (8). The amount of the pressure is thus adjusted according to the dimensions of the calender and the nature of the paper.

A means of automatic manipulation of the counterweight in a calender is shown in Fig. 2. The motor (1) is connected by means of the coupling (2) to a worm gear (3). The gears (4), (5) and (6) control the crank lever (7) and thus the crank (13) through the connecting rod (12). The



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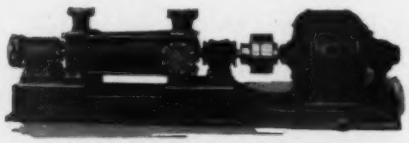

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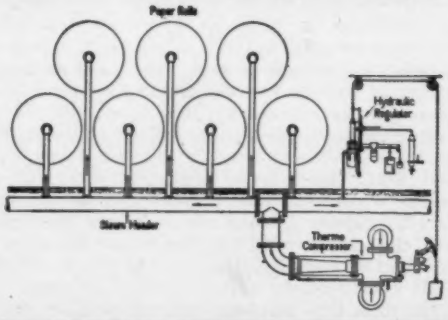
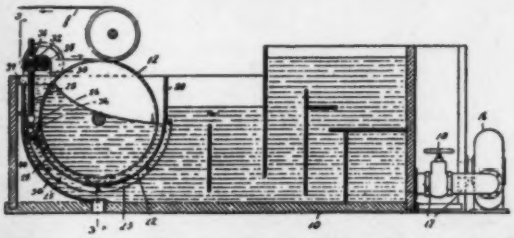


crank (13) is keyed to a shaft which operates the levers (10) shown in Fig. 1 and the counterweights are thus raised and lowered. As soon as the crank (13) attains its position to the right or left, the circuit breaker (11) throws the motor (1) out of the circuit. A cam (8) fixed on the crank (7) actuates the circuit breaker. R. Pouchart, Le Papier, 1929, pages 1099-1102.

Papermaking Machine

A PAPERMAKING machine consists of a vat (10) for containing the mixture of pulp and water, and an endless web forming screen (12) for continuous movement down-



ward into and upward out of the vat. Means are provided for withdrawing water from the space within the screen and to discharge it into the vat. Means are also provided for preventing the flow of water from the vat through any portion of the screen during the initial period of its submergence. Means are also provided for varying the area of the submerged portion of the screen through which flow will be permitted at one time. E. K. Mansfield, White Plains, N. Y. United States Patent No. 1,746,708, filed January 18, 1928.

Experiments on Rosin Sizing

EXPERIMENTS were made to determine the degree of sizing quality obtainable from amounts of rosin added less than 0.7 per cent. The sheets were made from bleached sulphite pulp beaten to about 40 wetness on the Schopper Riegler scale. The vat contained 150 grams of the beaten pulp to 18 liters of water. The rosin was precipitated with sulphuric acid by bringing the pH value of the vat to 5.0. Then alum in a five per cent solution was added ten cc. at a time and a sheet made after each addition. The comparative sizing figures obtained follow:

0.6 per cent rosin	60.81 comparative sizing
0.48 per cent	40.40
0.36 per cent	39.62
0.24 per cent	21.18
0.12 per cent	6.11

Experiments were also made to show that it is possible to hard-size unbeaten pulp when 40 and 50 cc. of five per cent alum solution were used. Exact conditions must be maintained to accomplish this.

Experiments were also made in hard-sizing without alum. It is indicated that sizing without alum may be a different process from sizing with alum, and that wetter pulps or greater amounts of rosin than usual are used when this is obtained. S. R. Edge, The Papermaker and British Paper Trade Journal, 1929, 595-7.

Determination of Lignin

VARIOUS methods used in the determination of lignin in wood are briefly reviewed. Six methods are discussed under acid hydrolysis, namely hydrolysis with sulphuric acid, with hydrochloric acid, with sulphuric and hydrochloric acid, with hydrochloric acid and phosphorus pentoxide, with hydrochloric acid and phosphoric acid, and with phenol and a mineral acid. Other methods included in the discussion are the hydrolytic-alkaline method, the halogen method, the chlorine dioxide method, the methoxyl method and the phloroglucin and hydrochloric acid method. The lack of agreement between the results obtained by these various methods is noted.

A new method is described which depends on the fact that all ligneous tissue when impregnated with formaldehyde solution will dissolve in concentrated sulphuric acid, especially when the mixture is allowed to heat up a little. After solution the dissolved substance is precipitated by pouring the solution into distilled water. The precipitate is filtered, washed and weighed. Examples are given of the application of this method, which is explained in detail, on various woods, such as raw spruce meal, alkali extracted spruce, alkali-extracted balsam fir, etc. Pulp and Paper Magazine through The Paper Makers' Monthly Journal, 1929, pages 324-328.

Consumption of Energy in Paper Machine

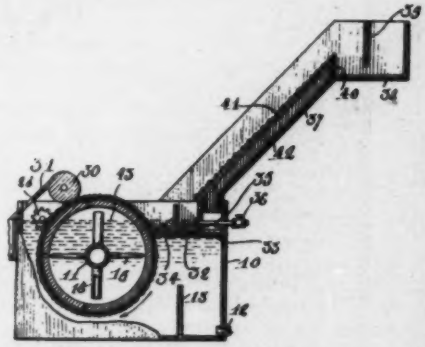
A THOROUGH study is made of a paper machine which is provided with roller bearings, to determine the consumption of energy in the operation of the machine. Numerous charts are given showing the consumption of energy in various parts of the machine with different speeds of travel of the paper web. The savings gained by the use of roller bearings are clearly demonstrated. J. Schoengut, Der Papier-Fabrikant, 1929, pages 613-626.

Improvement in Papermaking Machine

THE forming section of the fourdrinier machine consists of a shakable breast roll including a proper support for the same, and a normally stationary frame carrying table rolls and save-alls. This frame is supported independently of the breast roll and in alignment with it. Means are carried by the breast roll support for deflecting fluid matter from the breast roll to the save-alls. These means are shakable with the breast roll. H. L. Kutter, Hamilton, O. United States Patent No. 1,721,699, filed Aug. 29, 1925.

Pulp Strainer

THE apparatus consists of a vat (10) for holding the white water. A hollow shaft (11) extends through the vat and is divided so as to form separate chambers. A perforated cylinder, as shown, is mounted for rotary movement about the aforementioned shaft. Suction tubes (16) are connected with one chamber of the shaft and extend downwards within the cylinder for exhausting the water from the



latter. A ventilating tube is connected with the shaft and communicates with the opposite chamber extending vertically upward within the cylinder to supply air into the upper portion of the cylinder above the water line (43). Means are provided for removing the stock deposited on the exterior of the cylinder. These are shown at (32). L. B. Decker, Kenogami, Que., Canada. U. S. Pat. No. 1,731,193, filed Dec. 27, 1927.

Recovering Chemicals from Waste Liquor

THE process is concerned with the recovery of a solution containing sodium carbonate and free from sodium sulphide from waste liquor recovered from a process of pulping wood in which salts of sodium and sulphur are used. The waste liquor is concentrated, and it is then incinerated to form an ash. The ash is treated with a mixture of air and steam and under temperature conditions sufficient to cause combustion of part of the carbon present in the ash. The sodium sulphide is converted into sodium carbonate and the sulphureted hydrogen is removed. The resulting ash is then dissolved in water. F. G. Rawlins, Madison, Wis. United States Patent No. 1,728,252, filed Feb. 4, 1927.

Where Tax Payers Really "Shell Out"

IN darkest Africa, where white men go only when accompanied by elephant guns and motion picture cameras, the natives still pay their income taxes with cowry shells.

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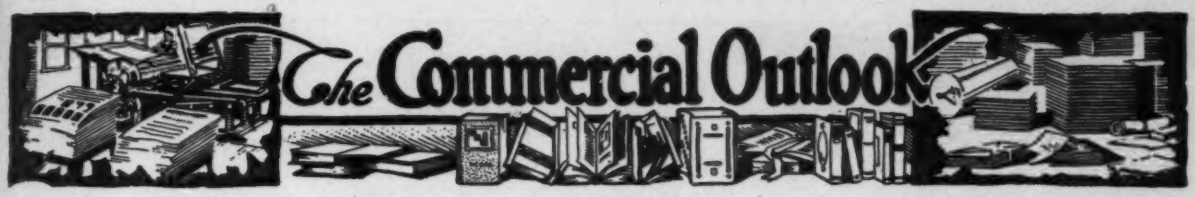


IT is generally conceded that business in paper is not developing in a volume that was anticipated for about this time, and that the market in its entirety is comparatively quiet. There is no doubt that the general hesitancy in business is being reflected in the paper market. Buyers are reluctant to acquire supplies unless they are in actual and immediate need of paper and board, and they apparently take the view that market circumstances are in their favor, and that therefore there is no reason for them to absorb supplies against forward requirements.

In other words, buyers of paper are acting as are buyers of other commodities. Orders are being confined to urgent needs mostly, and future wants are being left to take care of themselves. There is a policy in vogue at present to keep assets as liquid as possible, which reflects the general uncertainty over how and to what extent business in general is likely to develop during the next few months. This, of course, is limiting to no little degree the demand for paper, and manufacturers are feeling the restricted buying and in some instances are so eager for additional orders for their product that they are not refraining from granting price concessions in an effort to stimulate demand. Consequently, not only is the scope of current business unsatisfactory to paper manufacturers and merchants, but the price condition is none too favorable and is a matter causing no little worriment to the producer and distributor of paper.

However, signs on the business horizon appear encouraging. There are indications that sentiment is on the mend, and with it some improvement is being registered in general business. Moreover, most of the authorities on the subject are predicting an early return to activity of most lines of business, and the common opinion among manufacturers and merchants is that the latter half of this year will witness commercial activity on a broad scale. With this in view, it naturally follows that demand for paper of various kinds should be good because paper is consumed in so many directions that if general business becomes brisk, a bigger call for paper necessarily must ensue.

It can be said that perhaps one of the principal reasons the present demand for paper is so restricted can be attributed to paper manufacturers themselves. There has been price-cutting recently. Some papermakers have slashed prices in the hope of inducing their customers to buy in larger tonnage, and this policy seemingly is having just the opposite effect on the market to that desired. Paper jobbers and other distributors, as well as consumers and converters, have been made to adopt an ultra-cautious attitude in regard to purchases, in the fear that if they bought supplies ahead they suddenly would find themselves with stocks or commitments at unfavorably high prices in comparison with the prices at which they could effect further purchases. This has happened recently, and in far too many cases, and it is no wonder that buyers are now exercising the greatest care in their absorption of supplies, with the obvious result that demand is cut down below the level that in all probability would be seen if manufacturers of paper had pursued a wiser price policy.

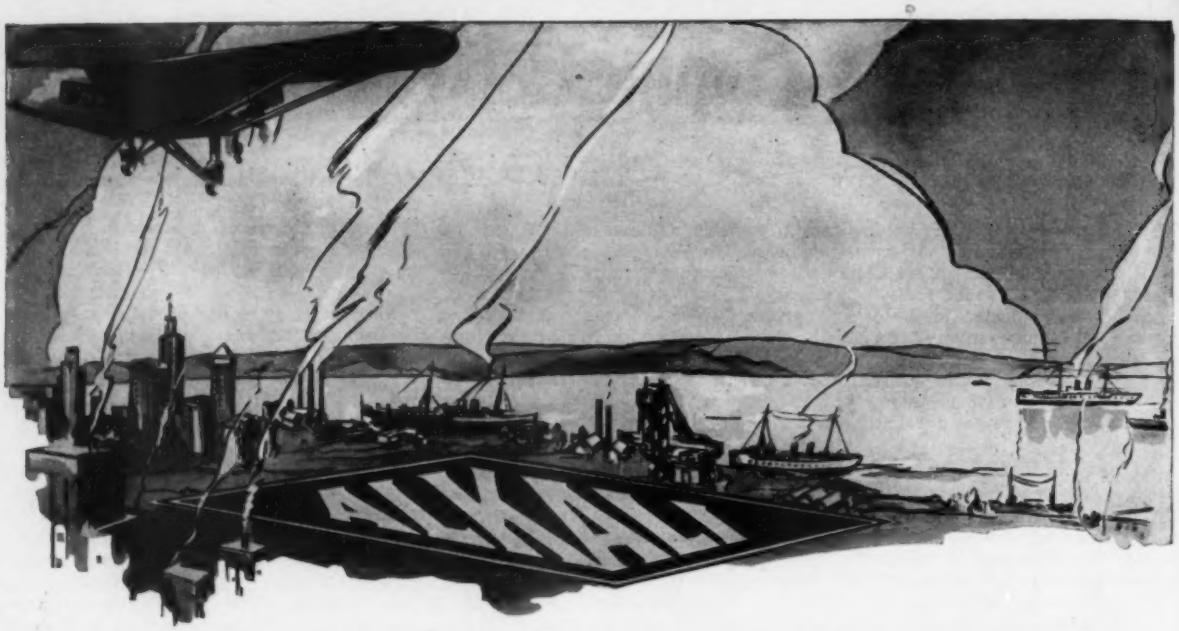
A high level of paper production in the United States was reached during the year of 1929, according to statistics just released. Identical mills reporting to the American Paper and Pulp Association, and representing about 70 per cent of the country's productive capacity, produced a total of 6,852,773 net tons of paper and board of all kinds, showing an increase of about 5 per cent over the 6,496,056 tons produced by the same mills during 1928. Adding another 30 per cent to the production of last year for those mills not reporting, the total output in 1929 reached approximately 8,908,604 net tons. The production of uncoated book paper last year was 10 per cent over the 1928 output, that of paperboard 9 per cent greater, of tissue paper 7 per cent, of felts and building paper 6 per cent, and of bag paper 2 per cent. The 1929 output of wrapping paper, however, was some 5 per cent below the 1928 production, while hanging paper production declined 3 per cent, and newsprint output was 2 per cent less.

Production of paper in December, according to the Association's figures, amounted to 502,061 net tons, or considerably under the 565,916 tons produced in the preceding month. Shipments from mills during December aggregated 495,893 tons, or within 6,000 tons of the output in that month, and contrasted with 561,499 tons shipped in November last, while stocks at mills at the end of December totaled 254,494 tons of all grades, against 248,359 tons a month previously.

The production of newsprint registered a decline in January as compared with the preceding month, the total output in the United States and Canada amounting to 331,156 net tons and shipments from mills to 326,270 tons in January, against 342,591 tons produced and 351,231 tons shipped in December, according to the News Print Service Bureau. Production in the U. S. in January was 124,851 tons and shipments from mills were 124,262 tons, against 112,583 tons manufactured and 117,131 tons shipped in December, while Canadian mills made 206,305 tons and shipped 202,008 tons in January, contrasted with 230,008 and 234,100 tons respectively in December. During January, 23,263 tons of newsprint were made in Newfoundland and 1,728 tons in Mexico, so that the total North American production for the month amounted to 356,147 tons. The Canadian mills produced 8,138 tons less in January than in the same month of 1928, while U. S. mills produced 1,029 tons more than last year. During January the Canadian mills operated at 71.4 per cent of their rated capacity, the U. S. mills at 85.3 per cent, and Newfoundland mills at 97.1 per cent. Stocks of newsprint at Canadian mills totaled 29,154 tons at the end of January, and at U. S. mills 18,778 tons, making a combined total of 47,932 tons which was equivalent to 2.9 days' average production.

Mills in the United States manufactured a total of 2,912,903 net tons of paperboard during the calendar year of 1929, recording an appreciable gain over the 2,682,645 tons produced in 1928, according to statistics compiled by the U. S. Department of Commerce. Production last year was at the rate of 80.3 per cent of the mills' capacity, against 78.9 per cent in the preceding year. Board output amounting to 186,683 tons in December fell well under the 237,496 tons produced in November last, and shipments from mills dropped from 236,575 tons in November to 182,204 tons in December. New orders received by manufacturers during December called for 174,717 tons, against 212,186 tons in November, and unfilled orders held by mills at the end of December were for 59,721 tons, contrasted with 67,174 tons a month earlier. Stocks of board at mills at the end of 1929 aggregated 65,178 tons, compared with 60,703 tons at the end of November last.

There has been a rather drastic reduction in quotations on southern kraft paper, amounting to $15 per ton, with current prices of such paper delivered New York about 4.50 cents a pound in sheets and 4.25 cents in rolls. Newsprint is reported moving into consumption in fairly large tonnage, some increase having been noted in recent weeks, and quoted rates are unaltered. Fine papers are moderately active, and most lines are quotably maintained. Wrapping is quiet, with the price situation decidedly unsettled, and there is limited demand of importance for tissue. Book paper is moving well into regular channels, with prices none too steady. Boxboard is still in the doldrums as far as demand is concerned, and prices are no more than holding their own while exhibiting a soft undertone.



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Papermaking Rags

It is very evident that paper manufacturers are purchasing rags in a reserved manner, the same as they are absorbing other classes of raw material. The rag market is characterized by fair activity in some quarters and involving some grades, but demand is of restricted dimensions and the aggregate volume of business developing does not begin to measure up to more active periods witnessed in the past. However, since this is the time of the year when incoming supplies are at a minimum, owing to inclement weather hampering collections in most parts of the country, prices are holding their position fairly well, and there has been little change of consequence in ruling values despite the rather quiet condition of the market.

The rag situation is neither unfavorable or altogether favorable to paper manufacturers. There is no scarcity of most grades; in fact, indications point to ample supplies being available, although there are a few kinds of rags which are in relatively low supply and which are held at comparatively firm prices by dealers who are hesitant about entering sales commitments unless obtaining prices they consider the rags concerned are fully worth under prevailing supply conditions. This holds especially true as regards certain descriptions of new cotton cuttings; slight premiums in price being asked in some instances on such grades, which are in limited supply and which are being produced in small quantities at present. Most old rags are fairly plentiful, yet dealers assert that incoming supplies now are seasonably small, and that firm prices are being demanded at collection sources. Low prices prevailing on waste paper, woolen rags and other classes of waste material are diminishing collections of rags the country over, it is said as a great many gatherers of such materials have forsaken the industry, having found that it is extremely difficult for them to eke out a livelihood under prevailing market conditions. Therefore, the claim in the trade is that dealers and graders have fewer rags in stock, that they are adding but slightly to their holdings, and that any appreciable broadening of paper mill buying might make for a quick upturn in market values. On the other hand, it would seem impossible for any material strengthening in prices so long as consumers continue to buy as they are and have been buying recently.

Old white and blue cottons are favored with moderate demand, and are reported bringing steady prices. Repacked No. 1 whites of New York City origin are selling to paper mills at 5.50 to 6 cents a pound f.o.b. that city, and some of the extra quality packings are fetching well above 6 cents at shipping points, while No. 2 repacked whites are quoted at 2.75 to 3 cents a pound at dealers' points, and repacked thirds and blues at 2.50 to 2.75 cents. Domestic roofing rags are moving into consuming channels in a fairly consistent way though in somewhat limited tonnage, with dealers reporting sales at 1.90 cents a pound f.o.b. shipping points for No. 1 roofing or cloth strippings, and at 1.25 to 1.30 cents for No. 2 stock. Roofing felt mills are resorting to little buying of foreign rags, and are said to be generally indisposed to grant more than about 1.50 to 1.55 cents a pound ex dock New York for foreign dark colored cottons.

New No. 1 white shirt cuttings are down a bit more in price to where sales at 8.50 cents a pound f.o.b. shipping points have been reported. New unbleached muslins are in fair demand and are quoted at 10.25 to 10.50 cents a pound at shipping points, while new blue overall cuttings are reported available at 7.50 to 7.75 cents, fancy shirt cuttings at 6 to 6.25 cents, No. 1 washables at 5 to 5.25 cents, and light silesias at 7.75 to 8 cents per pound.

Foreign rags generally are in little better than routine call from paper mills, and prices are rather in favor of buyers although importers assert that prices abroad have steadied in most cases, with shippers resisting any additional decline.

Average quotations f.o.b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	8.50– 9.00
White shirt cuttings, No. 2	6.50– 7.00
Fancy shirt cuttings	6.00– 6.25
Washables, No. 1	5.00– 5.25
Unbleached muslins	10.25–10.50
White lawns	9.00– 9.25
Overall cuttings, blue	7.50– 7.75
Black silesias	4.75– 5.00
Canton flannels, bleached	9.25– 9.50
Canton flannels, unbleached	8.00– 8.50
Shoe cuttings, bleached	7.50– 7.75
Shoe cuttings, unbleached	6.50– 6.75
Light silesias	7.75– 8.00
O. D. khaki cuttings	6.00– 6.25
Mixed khaki cuttings	5.00– 5.25
Corduroy cuttings	3.25– 3.50
Cottonade cuttings	3.00– 3.25
Linens, No. 1 white, foreign	14.00–15.00
Light prints, foreign	4.00– 4.50
Old stock—	
Whites, No. 1, repacked	5.50– 6.50
Whites, No. 2, repacked	2.75– 3.00
Whites, house soiled	2.00– 2.25
Whites, street soiled	1.75– 2.00
Lace curtains	5.00– 5.25
Thirds and blues, rough	1.80– 2.00
Thirds and blues, repacked	2.50– 2.75
Black stockings	4.10– 4.25
Cotton canvas, No. 1	4.25– 4.50
White cotton batting	2.50– 2.75
Roofing, No. 1 (cloth strippings)	1.85– 1.95
Roofing, No. 2	1.25– 1.35
Linsey garments, foreign	1.75– 1.85
Dark colored cottons, foreign	1.50– 1.55
Blue linens, foreign	4.00– 4.50
Gray linens, foreign	4.50– 5.00
White linens, foreign	8.00– 9.00
Light prints, extra, foreign	2.50– 2.75

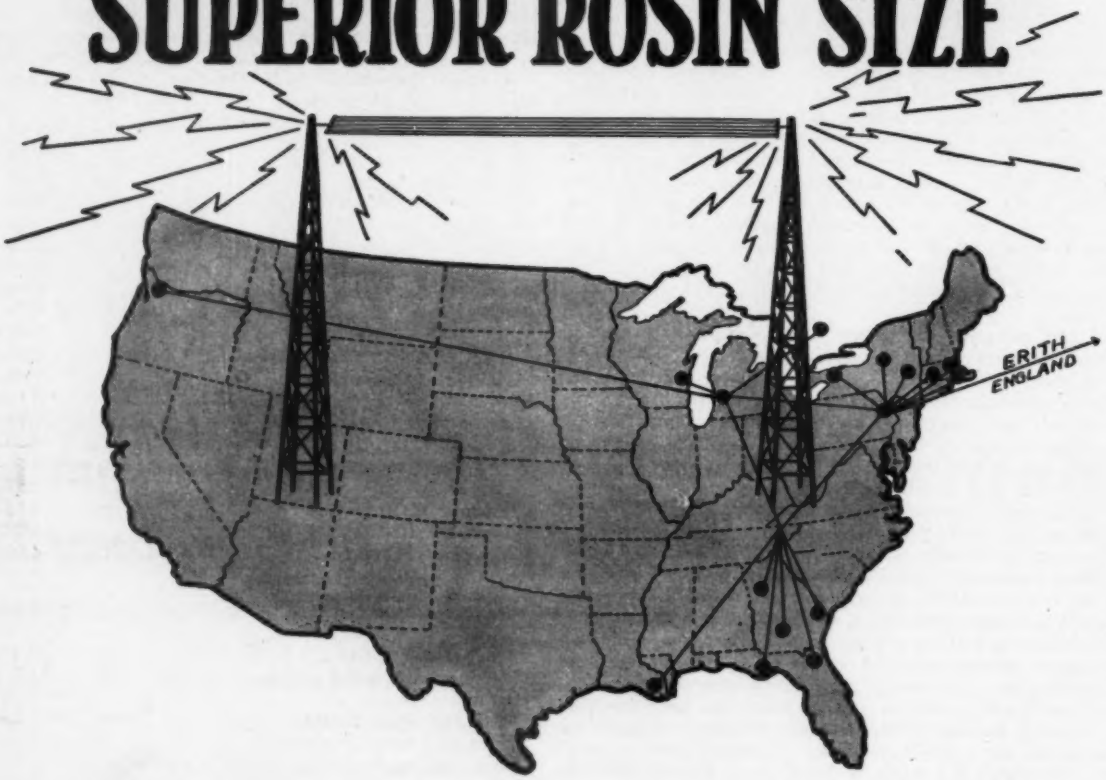
Rope and Bagging

A firming tendency in gunny bagging and an easing trend in old rope prices are the outstanding features in the old rope and bagging market. Prices of gunny bagging have stiffened a bit to where dealers are quoting at least 1.60 cents and often 1.65 cents a pound f.o.b. shipping points for No. 1 domestic gunny, and 1.55 cents and higher for No. 1 foreign gunny. Scrap burlap bagging is quiet other than for occasional purchases of No. 1 scrap by paper mills at about a price level of 1.60 cents per pound at dealers' shipping points. Roofing bagging is weak in price at around 1.15 cents a pound at shipping points.

Few papermakers are manifesting buying interest in old rope, and it is stated that seldom is higher than 4.50 cents a pound f.o.b. dealers' points bid for No. 1 domestic old manila rope, or above 4 cents a pound ex dock New York for imported old rope. Strings are in routine demand, and generally unchanged quotably.

F.o.b. shipping point and ex dock New York quotations follow:

BROADCASTING SUPERIOR ROSIN SIZE



With the starting of operations in our new factory at Portland, Oregon, we complete a *coast to coast* and an International *"Hook-up of Stations"* for supplying SUPERIOR ROSIN SIZE and other chemicals.

Service will be good from your *"Local Station"* and your 1930 *"Program"* will be free from *"Static"* if you use SUPERIOR CHEMICALS.

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PAPER MAKERS CHEMICAL CORP.

EASTON, PA.
KALAMAZOO, MICH.
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STONEHAM, MASS.
BOSTON, MASS.

ALBANY, N. Y.
LOCKPORT, N. Y.
CARTHAGE, N. Y.
PORTLAND, OREGON
PENSACOLA, FLA.
JACKSONVILLE, FLA

SAVANNAH, GA.
FARGO, GA.
ATLANTA, GA.
MARRERO, LA.
BURLINGTON, ONTARIO
ERITH, ENGLAND

	New York and Chicago
Gunny, No. 1 domestic	1.60– 1.70
Gunny, No. 1 foreign	1.55– 1.65
Scrap bagging, No. 1	1.55– 1.65
Roofing bagging	1.10– 1.20
Wool tares, heavy	1.65– 1.75
Wool tares, light	1.55– 1.65
Manila rope, No. 1 foreign	4.00– 4.25
Manila rope, No. 1 domestic	4.50– 4.75
Sisal strings	1.75– 2.00
Mixed strings	.90– 1.10

Old Paper

Most grades of waste paper remain in the doldrums, with demand from consuming quarters of very narrow compass and with prices weak decidedly. There has been no definite improvement in the market for low grades, such as old newspapers and mixed paper, and buyers are obtaining these descriptions at just about their own prices, and certainly at rates which show packers and collectors absolutely no profit. The higher qualities are but little better from a demand standpoint, although prices of these are on relatively higher levels.

No. 1 old mixed paper is selling in the East at as low as 15 cents per hundred pounds f.o.b. New York, and folded news down to 40 cents. In some other cities of the East, and in the Middle West, however, better prices than these prevail, substantially higher, in fact. Hard white shavings are in slow demand, whereas soft white shavings are reported moving fairly well. Quoted prices range from 2.60 to 3 cents a pound f.o.b. shipping points on No. 1 hard white shavings, and from 2.50 to 2.90 cents on soft white shavings. Heavy No. 1 book stock is bringing 1.30 cents a pound at dealers' points, and white blank news cuttings 1.70 cents. Kraft and manila grades are in limited call, and easy in price, and ledger stock is moving only into regular mill channels.

The following are quotations named by dealers f.o.b. shipping points, some of which are strictly nominal:

	New York and Chicago
Hard white shavings, No. 1	2.60– 3.00
Hard white shavings, No. 2	2.40– 2.60
Soft white shavings	2.50– 2.90
Colored shavings	.90– 1.10
Heavy book, No. 1	1.25– 1.35
Crumpled book, No. 1	1.00– 1.10
Ledger stock	1.05– 1.60
Kraft No. 1	1.50– 1.65
New kraft cuttings	2.15– 2.30
White blank news	1.65– 1.75
Manilas, No. 1	.55– .65
Manilas, container	.35– .40
Folded news	.40– .60
Sulphite mill wrappings	.50– .60
Old corrugated boxes	.40– .50
New corrugated box cuttings	.60– .70
Mixed paper, No. 1	.15– .40
Common paper	(Nominal)

Pulpwood

There is considerable apprehension felt in some quarters over the pulpwood outlook owing to the difficulty woodsmen have had in certain districts this winter getting wood out of the forests because of a lack of snow. The undertone of the market naturally is aided to some extent, and quoted rates are reported firm.

Exports of pulpwood from Canada in January, 1930, amounted to 120,063 cords, valued at $1,135,348, all of which came to the United States, and compared with 67,116 cords of a value of $694,955 exported in the preceding month, and 70,536 cords of a value of $649,837 in the corresponding month last year.

Mechanical Pulp

Market prices of mechanical wood pulp have eased to some extent, and are now exhibiting a softer undertone than has been seen in some while. The obvious reason for this is that grinders have been favored with weather conditions recently

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MANUFACTURERS OF
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ANIMAL SIZING GLUE STOCK

LARGEST SPECIALISTS IN AMERICA ON
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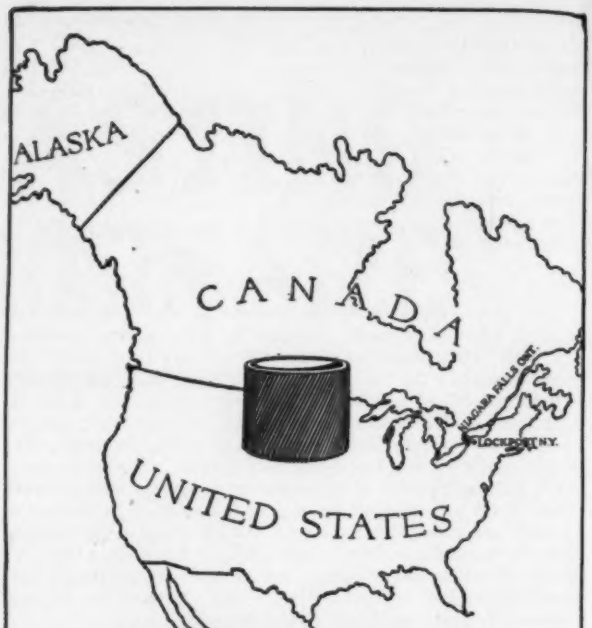

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THE KALBFLEISCH CORPORATION

New York

CLAY, CASEIN, ALUM, SATIN WHITE

ROSIN SIZE

enabling them to increase their grinding operations, and thus bringing larger available supplies into sight. Canadian groundwood is reported selling at $28 to $30 per ton f.o.b. pulp mills in the Dominion, with some producers asking $31 and $32, depending on the haul to consuming centers and the air dry test. Domestic groundwood is on a price level of around $31 or $32 a ton at grinding plants. Scandinavian groundwood is comparatively steady quotably at $35 per short ton for dry and $32 for moist pulp, ex dock American Atlantic ports.

Production of groundwood in the United States in December last amounted to 82,240 net tons, according to identical mills reporting to the American Paper and Pulp Association, as compared with 79,408 tons produced by the same mills in November. Total production last year reached 1,042,310 tons, contrasted with 1,019,731 tons manufactured by identical mills during 1928, and 1,030,966 tons in 1927. Mill stocks at the end of December last totaled 43,932 tons, against 45,947 tons a month earlier.

Chemical Pulp

A new high record of chemical wood pulp production in the United States was established during 1929, according to identical mills reporting to the American Paper and Pulp Association. Last year a total of 1,554,749 net tons of chemical pulp was manufactured by mills in this country representing about 60 per cent of the productive capacity of the United States, compared with 1,487,244 tons produced by the same mills during 1928, and 1,292,315 tons in 1927. Production in December last amounted to 120,345 tons of chemical grades, against 126,591 tons in the preceding month, while stocks at producing mills at the end of December aggregated 22,050 tons, contrasted with 21,919 tons a month previously.

The chemical pulp market is moderately active only, with consumers buying in a guarded manner chiefly to satisfy actual needs. Many users seem to be getting along at present with contract commitments without having to augment their supplies, and are keeping almost entirely out of the market. Prices are fairly steady though there has been some little recession in some grades. Domestic bleached sulphite is quoted all the way from a low of about 3.25 cents a pound up to 4.75 cents for the extra quality brands, while news grade unbleached sulphite is quoted 2.50 to 2.75 cents, and book sulphite at 2.75 to 3 cents, f.o.b. pulp mills. Bleached soda pulp is around 3.50 cents per pound delivered paper mills. Kraft is on the easy side quotably at from about 2.40 cents upwards per pound, depending on quality.

Quotations f.o.b. pulp mills are as follows:

Bleached sulphite	3.25–4.75
Easy bleaching sulphite	2.65–2.90
Unbleached sulphite, No. 1 strong (news grade)	2.50–2.75
Unbleached sulphite, No. 1 book	2.75–3.00
Soda pulp, bleached (delivered)	3.35–3.60
Mitscherlich, unbleached	3.00–3.25
Kraft, No. 1	2.40–2.85
Screenings, refined	1.60–1.85

Chemicals

A rather consistent movement of chemicals to paper and pulp manufacturers is reported on contact, but fresh demand is developing spottily, and mostly for limited-sized quantities of the various materials. Quoted prices are holding their own in a majority of cases. Casein is on a price basis of 14 to 15 cents a pound, with the imported product quoted at practically the same figures. A feature is the strong price position of salt cake, which is reported scarce, and quoted from $22 to $25 per ton.

Average quotations are as follows:

Alum, lump ammonia	3.50 – 3.75
Alum, lump starch	3.75 – 4.00
Blanc fixe, powdered	3.75 – 4.00
Bleaching powder	2.00 – 2.35
Brimstone (long ton, at mine)	18.00 –20.00
Casein (duty paid)	14.00 –15.50
Caustic soda, spot delivery	3.30 – 3.35

What Price Whoopee?

Ever since the stock market did some tricks to a punch-drunk public, apparently a need has been felt to bolster faith in the many-mentioned "Great American Market". A flood of admonitions to "perspire and profit" have been released. The advertising agency advertisement "Let's Get to Work" has been quoted in many such an appeal.

Perhaps those who risked bread and butter money on the wheel of Chance have not yet learned a lesson. But it seems logical to suspect that by now those who neglected the office for the ticker have had time to find out what rapid strides the fellow across the street made meanwhile.

Paper has always been the business of the Seaman Paper Company—the selling of it, and the working with mill organizations to make it more saleable. Reputation, service, and pounding the pavements sell Seaman Papers. For a steady flow of sales, common sense dictates the need of concerted, consistent sales effort. Seaman men know that there is no substitute for such effort.

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SEAMAN-PATRICK PAPER COMPANY
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ARTESIAN BOND *a rag-content, loft-dried, hand-sorted bond, of unusual brilliancy of color*

ARTESIAN BOND, like all other WHITING-PLOVER papers, is made with the purest spring water, assuring the utmost uniformity of printing quality and appearance.

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WHITING-PLOVER PAPER COMPANY

New Papers

Writing—	
White rag	15–40
White sulphite	9–30
Colored rag	15–40
Colored sulphite	8–30
Ledger—	
White rag	16–40
White sulphite	10–30
Colored sulphite	10–30
Colored rag	15–40
Bond—	
White rag	16–40
White sulphite	8–30
Colored sulphite	8–30
Colored rag	15–40
Book—	
No. 1 S. & S. C.	5.75– 8.00
Machine finished	5.50– 8.00
English finish	5.50– 8.00
Coated and enameled	7.50–12.00
Lithograph, M. F.	7.50–12.00
Newsprint—	
Rolls, contract, per ton, delivered New York	62.00–
Rolls, transient, per ton, delivered New York	62.00–
Sheets, per ton, delivered New York	67.00–
Side runs, per ton, delivered New York	47.00–52.00
Cover stock—	
Coated, both sides	–10.25
Coated, one side	–10.15
Tissue—	
No. 1 white, 20x30	.75– .90
No. 2 white, 24x36	.75– .90
No. 1 Manila, 24x36	.75– .80
Kraft	.95–1.10
Wrapping—	
No. 1 kraft	6.00–6.50
No. 2 kraft	4.00–5.00
Southern kraft	4.00–4.25
Boards—	**New York and Chicago**
Solid news	40.00–45.00
Straw	50.00–55.00
Plain chip	32.50–35.00
White coated chip	50.00–55.00
Manila coated chip	45.00–50.00
Binder's board	65.00–70.00

Chemicals

(*Continued from page 2093*)

China clay, domestic washed	8.00	–13.00
China clay, foreign	15.00	–21.00
Rosin, Grade E	8.15	– ....
Satin white	2.00	– 2.25
Soda ash, 58 per cent light (bags)	1.32½	– ....
Starch, papermakers', in bags	3.82	– ....
Talc (ton)	16.00	–18.00

Duty on Japanese Tissue

A question which has been before the Customs Court since 1924, when the Import Committee was first organized has been settled by the United States Court of Customs and Patent Appeals, by a decision that Japanese handmade tissue paper is dutiable as tissue paper at 6 cents per pound and 15 per cent, and is not dutiable as handmade paper at 3 cents per pound and 15 per cent. The lower court held that the language of the tariff law gave precedence to the words providing for a duty on handmade paper. The Appellate Court, however, in reversing this decision says:

"It clearly appears that Congress intended to limit the 'handmade paper' provision of this paragraph to handmade paper 'weighing 7 pounds or over per ream.' Strict rules of grammatical construction must yield to the manifest intention of Congress."

Customs officials have recently decided several problems of great importance to the paper industry. Among them are the following:

Paper in sheets 15 by 20 inches imported at San Juan, Porto Rico, was held to be dutiable as printing paper, not free of duty as standard newsprint as claimed by importers.

Lamp shade paper was held to be dutiable at 30 per cent as paper not specially provided for, and not dutiable at 3 cents per pound and 15 per cent as drawing paper as claimed by importers.

Pattern paper was held to be dutiable as paper not specially provided for at 30 per cent, instead of as board at 10 per cent as claimed by importers.

Seven importations of handmade paper were held to have been undervalued.

Forty-three importations of German wallpaper were held to have been undervalued.

Work of Import Committee of the Paper Industry

In making its annual report of its year's operations, the Import Committee of the American Paper Industry announced that during 1929 it handled 583 separate problems, involving over 1,000 importations of paper which were believed to be in violation of the tariff law. During the year decision was reached in 479 cases, and 288 of these decisions were favorable to the position of the Import Committee. Since the committee was formed, there have been over 5,000 importations investigated in which there was reason to suspect evasion of the Tariff law, and of the cases decided, a large proportion has been favorable to the position taken by the paper industry through the Import Committee.

During the year some most vital test cases were decided by the Customs Courts. Of these, the decisions of the United States Court of Customs and Patents Appeals in the so-called Heffernan and Side-Run News cases can be listed as decisions which would alone justify the entire expense of the Import Committee in its five years of activity. The decisions in these cases, involving judicial determination of the meaning of the words "Standard Newsprint Paper" in the free list provision of the Tariff Act of 1922 and indirectly of the definition of standard newsprint promulgated as a result of the Import Committee's efforts in 1925, although that definition is not directly approved or disapproved, definitely restrict the importation duty free as standard newsprint paper to kinds of paper chiefly used by newspapers whether in composition, characteristics or dimensions.

Another important decision involved the application of 10 per cent additional duty on writing papers which are decorated or given a special finish, and literally hundreds of importations now pending in the Customs Courts are affected by this ruling. This ruling requires the payment of the 10 per cent duty on writing papers which are tinted, or which are given a decorative effect, even though this effect is not produced by secondary processes in the treatment of the basic paper.

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"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
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Our pulp is made from Canadian Spruce
We ship in Sheets, baled

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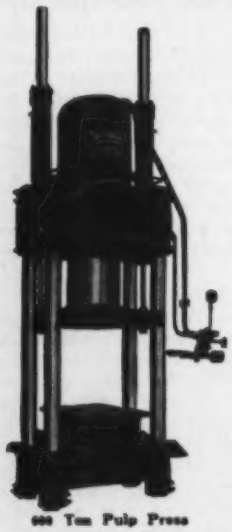
Hydraulic Equipment for Pulp and Paper Mills, Wall Board Plants, Etc.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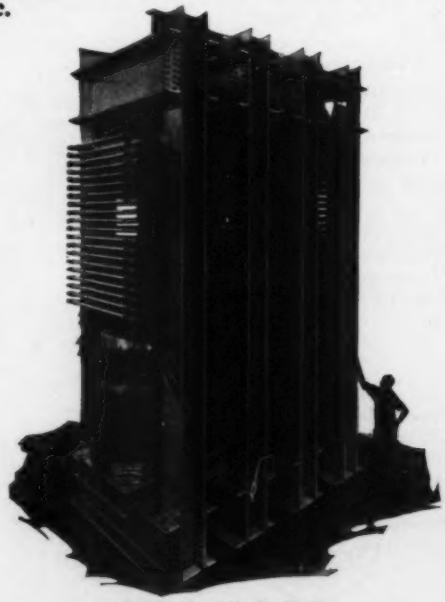
Southwark Hydraulic Equipment is the choice of the largest and best known Pulp and Paper Mills throughout the country. They find Southwark products give the most efficient service under exacting conditions. Write for Bulletin No. 14.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EXPORTS

The United States increased its exports of paper to a considerable extent last year, as compared with the preceding year. Exports of paper of all kinds from this country during the calendar year of 1929 reached a total value of $37,379,685, registering a gain in value of some $6,000,000 over the exportations valued at $30,933,131 in 1928, according to official figures compiled and issued by the U. S. Department of Commerce in Washington. Exports in the month of December last amounted in value to $3,146,709, contrasted with shipments of a value of $2,877,917 in November last year, and $2,697,288 in December, 1928.

Exports of newsprint from the United States in 1929 increased both as to quantity and value, total exports last year amounting to 37,391,882 pounds, valued at $1,346,018, against 22,779,930 pounds of a value of $865,956 in the preceding year. Exports of uncoated book paper during the past year aggregated 37,817,028 pounds, of a declared value of $2,651,325, compared with 24,510,519 pounds of a value of $1,789,694 in 1928.

Writing paper exports from the U. S. climbed from 25,833,846 pounds, valued at $2,832,934, in 1928, to 27,989,532 pounds of a value of $2,955,687 in 1929, while wrapping paper exports increased to 43,882,689 pounds of a value of $2,957,204 last year, against 36,757,253 pounds of a value of $2,586,848 in 1928. Tissue paper exports last year reached a value of $1,061,250, showing a decline as compared with shipments valued at $1,096,424 in the preceding year, whereas exports of cover paper were valued at $356,445 last year, against $340,972 in 1928, and exports of sheathing and building paper increased in value to $756,329, contrasted with $551,059 in 1928.

Exports of boxboard amounted to 53,458,595 pounds, valued at $1,614,535, in 1929, against 48,669,581 pounds of a value of $1,353,561 in the preceding year, and exports of other paperboard and strawboard increased to 47,315,391 pounds of a value of $2,096,798 last year, against 42,124,168 pounds of a declared value of $2,149,565 in 1928.

In paper products, there was a sharp gain in the value of exports of paper bags from the United States in 1929 to a total of $1,010,522, compared with $801,027 in 1928, while exports of paper boxes and cartons were valued at $1,891,939 last year, against $1,900,825 in the preceding year, and exports of envelopes reached a value of $428,551 last year, against $405,505 in 1928.

IMPORTS

Wood Pulp

A new high record of importations of chemical wood pulp into the United States was established during 1929, when a greater tonnage of such pulp was brought into this country from outside sources than in any previous twelve-month. Statistics just issued by the U. S. Department of Commerce show that during the last calendar year a total of 1,441,110 long tons of chemical pulp of all grades, of a total declared value of $82,840,220, was imported into the United States, compared with 1,351,005 tons of a value of $78,476,280 imported in 1928, and 1,280,285 tons of a value of $80,124,449 in 1927. In one other year, or in 1926, the value of chemical pulp imports exceeded that of last year, the declared value of the 1926 importations amounting to $83,208,851, but the tonnage imported in 1929 constituted a new high record, or some 90,000 tons above the previous high record reached during 1928.

Chemical pulp imports last year were divided 334,235 long tons of bleached sulphite, of a value of $25,338,603, against 307,771 tons of a value of $23,268,424 in 1928; 701,456 tons of unbleached sulphite of a value of $35,328,982, against 640,660 tons of a value of $32,587,134 in 1928, and 384,005 tons of sulphate pulp of a value of $20,518,676, against 381,256 tons of a value of $21,170,948, with the small remaining balance comprising miscellaneous grades. Imports of sulphite, bleached and unbleached, last year originated as follows: From Sweden, 397,351 long tons; Canada, 378,034 tons; Finland, 116,427 tons; Germany, 62,293 tons; Norway, 57,637 tons, and other countries, 23,949 tons. Imports of sulphate pulp last year came from these sources: From Sweden, 224,371 tons; Canada, 110,366 tons; Finland, 27,108 tons; Norway, 16,404 tons, and other countries, 5,756 tons.

Imports of mechanical pulp into the United States in 1929 totaled 244,162 long tons, valued at $6,245,776, compared with 222,499 tons of a value of $5,443,495 in 1928, and 219,285 tons of a value of $5,961,821 in 1927. Thus, while above the importations in the two previous years, groundwood imports were not as large last year as in 1923, 1925 and 1926.

The market for imported wood pulp has ruled comparatively quiet recently. There have been some sales running into sizable volume, but they have been rather spotty, and it has been quite evident that paper manufacturers have proceeded carefully in entering further commitments on pulp, especially since they apparently have their requirements moderately well covered for a time and since they have detected something of a sagging price trend in market values, and consequently have held off waiting developments in this connection. The sales recorded off and on have in some cases established slightly lower prices. For instance, the sale of a large tonnage of Swedish kraft pulp to a boxboard mill in this country was registered lately at a price basis of 2.25 cents per pound ex dock New York, which brought the price range on this class of pulp to a lower level.

Sellers have not pressed matters, but also have adopted a more or less waiting attitude, yet, of course, there has been a desire to effect sales in most quarters. Bleached sulphite of strictly prime foreign quality has been offered at 3.35 cents a pound ex dock American Atlantic seaboard, with extra qualities held far above this price or up to 4 and 4.25 cents. Prime easy bleaching sulphite is quoted at 2.85 to 3.10 cents a pound on the dock, and strong unbleached sulphite at 2.70 to 2.80 cents for prime grades. Most importers continue to ask 2.35 or 2.40 cents ex dock here for prime Scandinavian kraft pulp, though sales down to 2.25 cents have been noted. Scandinavian groundwood is relatively steady in price at about $35 per short ton ex dock American Atlantic ports for dry and $32 for moist pulp.

Current market quotations ex dock New York, and receipts at the port of New York during February, 1930, follow:

Bleached sulphite, No. 1	3.35– 4.25
Unbleached sulphite, strong No. 1	2.70– 2.80
Unbleached sulphite, No. 2	2.50– 2.70
Easy bleaching sulphite	2.85– 3.10
Mitscherlich unbleached, genuine	3.00– 3.25
Mitscherlich unbleached, ordinary	2.75– 3.00
Kraft, standard Swedish	2.25– 2.40
Groundwood, per ton (dry)	35.00–36.00

Bulkley, Dunton & Co., 2,375 bls. from Sandarne, 3,213 Bremen and 2,250 Gefle; American Express Co., 300 bls. from Hamburg; Castle & Overton, 10,192 bls. from Hamburg and 340 Rotterdam; Lagerloef Trading Co., 338 bls. from Helsingfors, 520 Tolkis, 2,446

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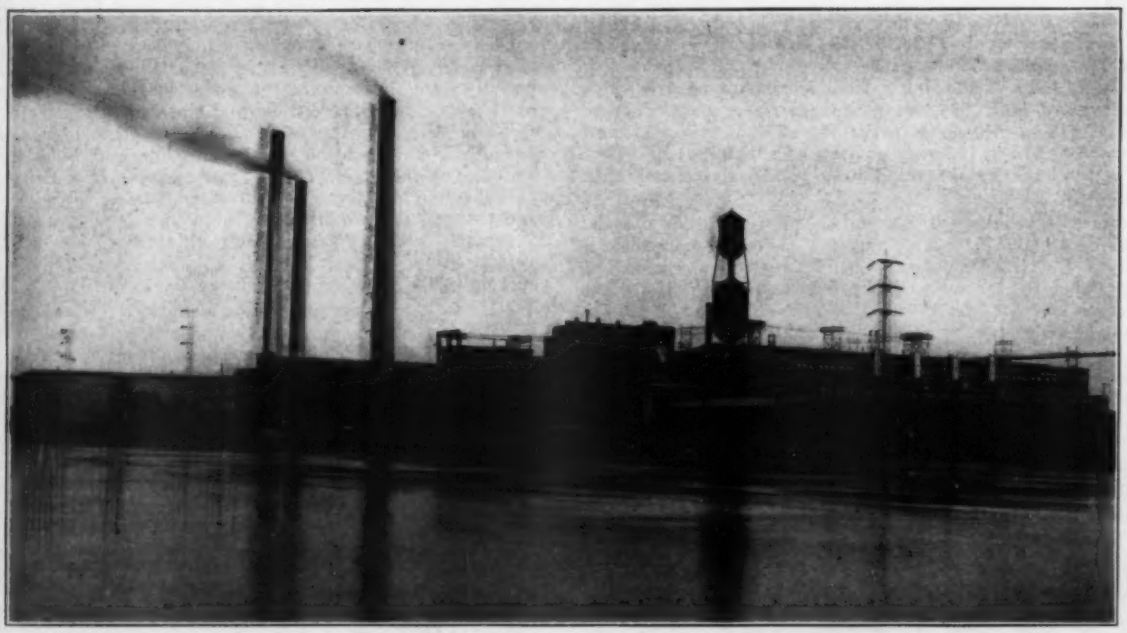
Kraft Pulp and Easy Bleaching Sulphate

Quality Pulp



The Pulp and Paper Trading Company

21 East 40th Street, New York, N. Y.

Sole Selling Agents for United States for

CANADIAN KRAFT, Ltd. - - Three Rivers, CANADA

Kotka and 640 Wiborg; Irving Trust Co., 127 bls from Hamburg and 350 Bremen; J. Anderson & Co., 2,003 bls. from Bremen, 3,000 Hernosand and 3,110 Greaker; Atterbury Bros., 2,510 bls. from Oslo; M. Gottesman & Co., 800 bls. from Sibenk; E. M. Sergeant Co., 50 lbs. from Oslo and 598 Gothenburg; Johaneson, Wales & Sparre, 1,300 bls. from Gothenburg; Pagel, Horton & Co., 500 bls. from Gefle; Order, 901 bls. from Hamburg, 3,000 Wallvik, 21,762 Hernosand and 1,750 Raumo.

Paper Stock

The United States imported a total of 446,496,028 pounds of rags for papermaking, of a declared value of $9,341,795, during 1929, compared with 439,892,896 pounds of a value of $9,195,224 in the preceding year, according to U. S. Department of Commerce official figures. Imports of waste bagging and waste paper last year amounted to 141,615,462 pounds, valued at $1,657,562, against 148,756,214 pounds of a value of $1,957,937 imported in 1928, while imports of old rope and miscellaneous paper stock last year were 131,084,841 pounds of a value of $3,448,438, contrasted with 70,723,965 pounds of a value of $2,065,267 in 1928.

Papermaking materials were received in rather small quantities during February, judging from arrivals through the port of New York. There were fair-sized imports of rags, old rope and old bagging, but receipts did not measure up to the amounts imported in the several previous months. Imports of all kinds of paper stock excepting wood pulp at New York last month, these data being taken from manifests of steamers reaching that port during the month, were as follows:

Old Rope—Brown Bros. & Co., 793 coils and 111 bls.; S. Birkenstein & Sons, 38 bls.; Banca Commerciale Italiana Trust Co., 213 coils; Furness, Withy & Co., 115 bls.; International Purchasing Co., 287 coils; William Steck & Co., 73 coils; R. M. Gray, Inc., 6 coils; New York Trust Co., 21 bls.; United Fruit Co., 2 bls.; Order, 360 coils and 69 bls.

Old Bagging—Darmstadt, Scott & Courtney, 205 bls.; Irving Trust Co., 75 bls.; International Acceptance Bank, 52 bls.; R. F. Downing & Co., 75 bls.; Van Oppen & Co., 668 bls.; Chemical Bank & Trust Co., 54 bls.; Seidel Herzog, 16 bls.; Ernst Mayer, 62 bls.; A. Bernstein, 50 bls.; Banca Commerciale Italiana Trust Co., 128 bls.; Order, 180 bls.

Rags—Castle & Overton, 450 bls.; Albany Fiber Co., 146 bls.; Victor Galaup, Inc., 454 bls.; G. Schuster, 5 bls.; S. Birkenstein & Sons, 453 bls.; Belgam Corp., 60 bls.; J. Reiss & Co., 37 bls.; J. Cohen & Sons, 15 bls.; Fritz Stern, 137 bls.; Ernst Mayer, 36 bls.; General Fiber Co., 55 bls.; Katzenstein & Kenne, 233 bls.; E. J. Keller Co., 210 bls.; American Rag Trading Co., 9 bls.; Darmstadt, Scott & Courtney, 132 bls.; Paul Berlowitz, 83 bls.; Manufacturers Trust Co., 73 bls.; The Barrett Co., 364 bls.; Forte Dupee Sawyer Co., 145 bls.; American Express Co., 131 bls.; Brown Bros & Co., 201 bls.; A. W. Fenton, Inc., 473 bls.; R. F. Downing & Co., 24 bls.; Van Oppen & Co., 58 bls.; Amtorg Trading Co., 867 bls.; Porto Rican Express Co.; 3 bls.; Baring Bros. & Co., 188 bls.; T. D. Downing & Co., 28 bls.; International Germanic Trust Co., 330 bls; New York Trust Co., 34 bls.; Irving Trust Co., 394 bls.; Guaranty Trust Co., 24 bls.; Hibernia Trust Co., 15 bls.; Merchants National Bank of Boston, 89 bls.; Equitable Trust Co., 1,780 bls.; Bank of New York & Trust Co., 62 bls.; National Bank & Trust Co. of Philadelphia, 62 bls.; Banca Commerciale Italiana Trust Co., 53 bls.; International Acceptance Bank, 17 bls.; Chase National Bank, 82 bls.; Bank of the Manhattan Co., 5 bls.; Philadelphia National Bank, 16 bls.; First National Bank of Boston, 26 bls.; Order, 1,957 bls.

Miscellaneous Paper Stock—George W. Millar & Co., 95 bls.; Harmon G. Lichtenstein, 68 bls.; S. Birkenstein & Sons, 178 bls.; International Germanic Trust Co., 151 bls.; Guaranty Trust Co., 260 bls.; Webster Atlas National Bank, 72 bls.; Irving Trust Co., 84 bls.; International Acceptance Bank, 80 bls.; Anglo-South American Trust Co., 75 bls.; Manufacturers Trust Co., 113 bls.; Milton Snedeker Corp., 69 bls.; Baring Bros. & Co., 119 bls.; Brown Bros. & Co., 340 bls.; Van Oppen & Co., 12 bls.; R. M. Gray, Inc., 162 bls.; Order, 347 bls.

Paper

Imports of paper into the United States during 1929 scored a fair increase in point of value over the importations in the preceding year, reaching a total value of $163,184,327 last year, against $156,406,552 in 1928, according to official statistics compiled by the U. S. Department of Commerce. Imports last year were, of course, principally newsprint, the total value of imports of such paper amounting to $144,492,736, contrasted with $139,432,918 in 1928, while imports of cigarette paper were valued at $3,921,984, against $3,213,981 in the preceding year, and of paperboard in rolls $1,271,740. contrasted with $1,150,968 in 1928.

Paper imports in February were comparatively light, judging from receipts through the port of New York. Some fairly large shipments of printing paper, wrapping and cigarette were received, however. Imports of all kinds of paper through the port of New York last month, these data being unofficial and taken from manifests of steamers reaching that port during February, were as follows:

Printing—Parsons & Whittemore, 268 reels from Helsingfors and 159 reels Hamburg; Lunham & Reeve, 357 reels from Helsingfors and 354 reels Kotka; Gilman Paper Co., 149 rolls from Sundsvall; Keuffel

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Conveyor or Gravity Feed Shredder

Give Beaters a Lift

The MITTS & MERRILL SHREDDER through it's economical method of preparing stock for the beater contributes much to the completion of the beater's work in the shortest possible time, thereby cutting down operating costs and speeding up the process of paper making.

MITTS & MERRILL SHREDDERS are built in sizes with spouts ranging from 18" to 45" wide. We will be glad to quote you on any size adapted to your requirements.

It gives the beater an economical lift.

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We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

See pages 372 and 373 in the 1929 Paper and Pulp Mill Catalogue

LIQUID CHLORINE

Single Unit Tank Cars Multi-Unit Tank Cars 150-lb. Cylinders
(1-Ton Containers)

Bleaching Powder

Natrona Porous Alum
(Iron Free)

Commercial Sulphate of Alumina

Manufactured by

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Dee Bldg. Traction Terminal Bldg. General Motors Bldg.
Boston, 10 High St. Dallas, Texas, Am. Ex. Bk. Bldg.
Los Angeles, Bartlett Bldg.

& Esser Co., 150 rolls from Hamburg and 24 cs. Rotterdam; Guaranty Trust Co., 81 bls. from Hamburg; E. Dietzgen & Co., 128 cs. from Rotterdam and 108 cs. Hamburg; B. F. Drakenfeld & Co., 49 cs. from Liverpool; Star Co., 1,603 rolls from Liverpool, N. S.; Clinton Paper Corp., 289 rolls from Liverpool, N. S.; New York Tribune, 1,739 rolls from Liverpool, N. S.; H. Reeve Angel & Co., 67 reels from Hamburg and 147 reels Kotka; P. C. Zuhlke, 133 cs. from Antwerp; F. C. Strype, 60 cs. from Rotterdam; Kennedy & Co., 3 cs. from Rotterdam; Perkins-Goodwin Co., 1,200 reels from Hamburg; Stora Kopparberg Corp., 129 reels from Gothenburg; W. H. Bell, 3,478 rolls from Liverpool, N. S.; J. J. Bernitz, 63 bls. from Hamburg; Martin & Bechtold, 38 cs. from Bremen; Order, 2,385 reels and 25 cs. from Bremen, 465 reels and 32 cs. Hamburg, and 126 reels Oslo.

Wrapping—J. P. Hefferman Paper Co., 2 cs. from Rotterdam; Sylvania Industrial Corp., 269 cs. from Antwerp; Standard Products Corp., 33 cs. from Antwerp; Robert Wilson Paper Corp., 27 bls. from Rotterdam; E. Dietzgen & Co., 59 cs. from Rotterdam and 2 cs. Antwerp; C. Steiner, 64 bls. from Rotterdam and 4 cs. Hamburg; Karl Pauli Corp., 3 cs. from Rotterdam; American Express Co., 187 cs. from Hamburg; Insight Paper Co., 200 reels from Oslo; C. K. MacAlpine & Co., 21 cs. from Gothenburg; Borregaard Co., 96 bls. and 272 reels from Gothenburg; F. L. Kraemer & Co., 233 bls. from Gothenburg; Wilkinson Bros. & Co., 35 bls. from Gothenburg and 90 reels and 24 bls. Oslo; Order, 5 cs. from Southampton and 42 reels Hamburg.

Cigarette—P. J. Schweitzer, Inc., 292 cs. from Marseilles; Standard Products Corp., 603 cs. from Havre; DeMauduit Paper Corp., 441 cs. from St. Nazaire and 1,215 cs. Havre; American Tobacco Co., 850 cs. from Bordeaux; Liggett & Myers Tobacco Co., 50 cs. from Liverpool.

Writing—Guibont Freres & Co., 4 cs. from Southampton and 9 cs. Havre; Coenca-Morrison Co., 5 cs. from Havre; H. Galland; 9 cs. from Havre.

Filter—H. Reeve Angel & Co., 19 cs. from Southampton; C. Sleicher & Scholl Co., 23 cs. from Hamburg.

Tissue—Baldwin Universal Co., 4 cs. from Liverpool; D. C. Andrews & Co., 15 cs. from Liverpool; W. J. Byrnes & Co., 3 cs. from Southampton and 13 cs. Liverpool; G. W. Sheldon & Co., 8 cs. from London; F. B. Vandegrift & Co., 20 cs. from Liverpool, B. F. Drakenfeld & Co., 3 cs. from Liverpool; F. C. Strype, 54 cs. from Helsingfors and 38 cs. Kotka; Order, 6 cs. from Genoa.

Drawing—Keuffel & Esser Co., 60 cs. from Hamburg; G. Henschel & Co., 8 cs. from Hamburg; W. C. Sullivan, 28 cs. from Hamburg; H. Reeve Angel & Co., 2 cs. from Southampton; P. C. Zuhlke, 2 cs. from Antwerp; P. Puttmann, 6 cs. from Antwerp; D. C. Andrews & Co., 32 cs. from Antwerp.

Hanging—A. C. Dodman, Jr., Inc., 62 bls. from Liverpool, 4 bls. Southampton and 3 cs. Havre; C. A. Haynes & Co., 96 bls. from London and 2 cs. Liverpool; W. H. S. Lloyd & Co., 10 bls. from London and 10 pkgs. Rotterdam; R. F. Downing & Co., 44 bls. from London, 4 cs. Yokohama and 36 cs. Southampton; F. J. Emmerich & Co., 404 bls. from Hamburg, 53 bls. Liverpool, 3 cs. Havre and 2 bls. Southampton; E. Steiger, 5 bls. from Hamburg; Globe Shipping Co., 130 bls. from Hamburg; F. A. Binder, 97 cs. from Bremen; Guaranty Trust Co., 105 cs. from Hamburg; C. Grimmer & Sons, 3 cs. from Rotterdam; Draeger Shipping Co., 8 bls. from Hamburg; Stern, Stiner & Co., 2 bls. from Hamburg; Irving Trust Co., 4 cs. from Hamburg; Panama-Pacific Line, 4 pkgs. from London; Order, 2 bls. from London, 2 cs. Rotterdam and 9 bls. Hamburg.

Photo—J. J. Gavin & Co., 3 cs. from Southampton; J. H. Shroeder Banking Corp., 537 cs. from Bremen; Gevaert Co. of America, 354 cs. from Antwerp; P. C. Zuhlke, 63 cs. from Antwerp.

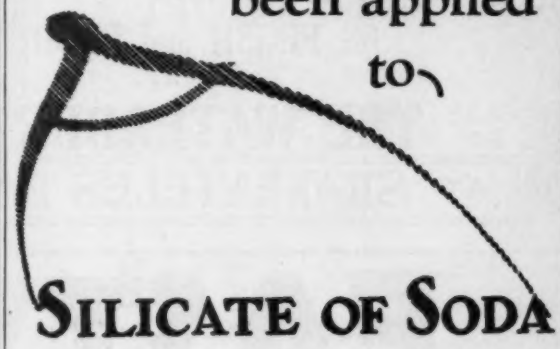
Board—Lagerloef Trading Co., 115 reels from Helsingfors; Robert Wilson Paper Corp., 73 rolls from Rotterdam; Order, 68 bls. from Hamburg and 15 bls. Bremen.

Miscellaneous—Japan Paper Co., 16 cs. from Southampton, 29 cs. Havre, 32 cs. Genoa and 9 cs. Rotterdam; Whiting-Patterson Co., 31 cs. from Southampton and 22 cs. Rotterdam; Eleto Co., 2 cs. from Southampton; W. A. Foster, 5 cs. from London and 5 cs. Southampton; E. Hennigson, 4 cs. from Bremen; Hensel, Bruckman & Lorbacher, 88 cs. from Bremen and 11 cs. Havre; F. L. Kraemer & Co., 42 cs. from Bremen and 14 cs. Havre; S. Gilbert, 33 cs. from Bremen; Henschel, Naeve & Co., 42 bls. from Bremen; Central Hanover Bank & Trust Co., 58 cs. from Hamburg; Pacific National Bank, 9 cs. from Hamburg; Fifth Avenue Bank, 4 bls. from Hamburg; P. H. Petry & Co., 3 bls. from Hamburg and 9 bls. Havre; Pennsylvania Railroad Co., 14 cs. from Hamburg; Whitfield Paper Works, 31 cs. from Kobe; Keller-Dorian Paper Co., 75 cs. from Havre; T. N. Fairbanks, 22 cs. from Havre and 12 cs. Genoa; J. Beckhardt & Co., 10 cs. from Bremen; Gunther Wagner Pelican Works, 8 cs. from Bremen; Borden & Riley Paper Co., 28 cs. from Antwerp; J. E. Bernard & Co., 23 bls. from Liverpool, 8 bls. Southampton and 27 cs. Antwerp; R. F. Downing & Co. 5 cs. from Havre; American Express Co., 12 cs. from Bremen, 94 cs. Hamburg, 30 cs. Rotterdam and 4 bls. Havre; International Forwarding Co., 30 cs. from Rotterdam, 69 cs. Antwerp and 8 cs. Hamburg; Globe Shipping Co., 18 cs. from Rotterdam; J. J. Shore & Co., 4 cs. from Rotterdam; Coenca-Morrison Co., 2 cs. from Havre; W. L. Haas, 11 cs. from Rotterdam; D. F. Young, 13 cs. from Hamburg; D. C. Andrews & Co., 2 bls. from Hamburg; Van Oppen & Co., 10 cs. from Havre; F. Murray Hill, Inc., 4 cs. from Bremen; F. C. Strype, 11 cs. from Yokohama; W. Van Doorn, 18 cs. from Rotterdam; Pacific National Bank of San Francisco, 30 cs. from Hamburg.

The Detroit district sales office of Cutler-Hammer, Inc., is now located at 2755 East Grand Boulevard, Detroit, Mich. The new location includes warehouse facilities where stocks of C-H products will be carried for immediate delivery.

S. B. Taylor has been recently promoted to assistant works manager of the Reliance Electric & Engineering Co., Cleveland, Ohio. Mr. Taylor has been with the company since 1925.

The Calipers have been applied to



SILICATE OF SODA

AND NOW you can know definitely what silicate of soda does for your sheet of paper and how it saves you dollars and cents. These facts come to you in the form of reports of complete surveys of mills which have used silicate in the beater for as many as 30 years. The surveys have been conducted by engineers of the A. C. Nielsen Co., of Chicago.

The answer to better paper at a saving is yours for the asking. May we send you the facts without obligation?

Silicate of soda for paper mills

"S" Brand and "A-Syrup"

Philadelphia Quartz Company

MAKERS OF SILICATES OF SODA

GENERAL OFFICES:

121 S. Third Street, Philadelphia

CHICAGO SALES OFFICE: 205 W. WACKER DRIVE

THE SIGN OF GOOD FELTS

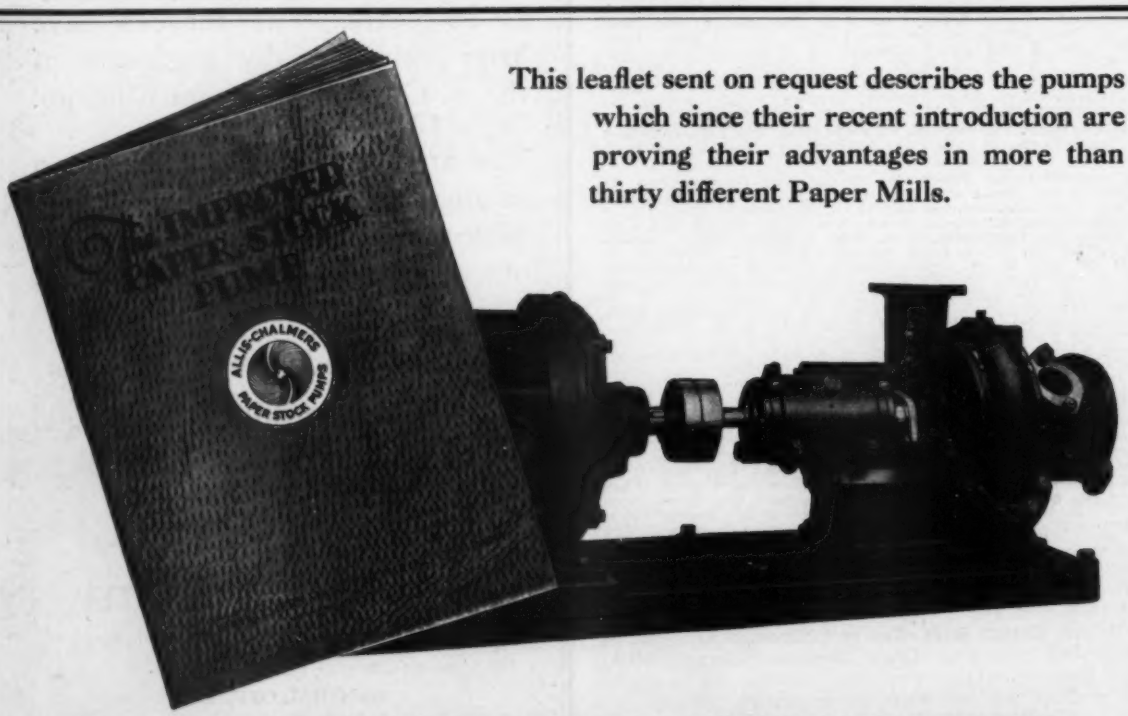
USE OUR TOP FELTS on your Board Machines
for FINISH and PRODUCTION

MADE BY THE WATERBURY FELT CO.
AT SKANEATELES FALLS, N.Y.

PAPER MAKERS
FELTS AND JACKETS

EASTWOOD
FOURDRINIER-CYLINDER-WASHER
WIRES

EASTWOOD WIRE CORPORATION, BELLEVILLE N.J. U.S.A.



This leaflet sent on request describes the pumps which since their recent introduction are proving their advantages in more than thirty different Paper Mills.

ALLIS-CHALMERS MANUFACTURING CO.
MILWAUKEE, WIS. U.S.A.

Foreign Trade Opportunities

The following foreign trade opportunities are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 43447—Drawing paper. Tientsin, China. Purchase desired.

No. 43351—Insulating lath and board. Hamburg, Germany. Agency desired.

No. 43446—Packing paper, asphalt, waterproofed and reinforced. Montreal, Canada. Agency and purchase desired.

No. 43327—Paper of all kinds. Jaffa, Palestine. Sole agency desired.

No. 43448—Printing, typewriter and accounting book paper. Tangier, Morocco. Purchase desired.

No. 43506—Mulch paper. Brisbane, Australia, Purchase desired.

No. 43578—Newspapers, overissued. Tsingtao, China. Purchase desired.

No. 43505—Toilet paper, paper towels, etc. Buenos Aires, Argentina. Purchase and agency desired.

No. 43499—Wood pulp mill machinery. Stockholm, Sweden. Agency desired.

No. 43746—Building materials, such as wallboard, insulating board, and plaster board. Auckland, New Zealand. Agency and purchase desired.

No. 43686—Fiber board, hard, for trunks and suitcases. Johannesburg, South Africa. Agency desired.

No. 43658—Newspapers, overissued. Amoy, China. Purchase and agency desired.

No. 43637—Packing paper, waterproof. Montreal, Canada, Agency desired.

No. 43638—Paper, of various kinds. Bombay, India. Agency desired.

No. 43745—Wallboard. Saigon, Indo-China. Agency desired.

No. 43746—Wrapping paper, heavy; fruit wrappers, toilet rolls, serviettes, etc. Auckland, New Zealand. Agency and purchase desired.

No. 43847—Cardboard stock for the manufacture of playing cards. Santiago, Cuba. Purchase desired.

No. 43802—Fiber-board fruit trays and boxes for parcel post shipments. Johannesburg, South Africa. Agency desired.

No. 43887—Newspapers, overissued, in bales; 22 tons. Gwalior, India. Purchase desired.

No. 43846—Toilet paper, cheap. Montreal, Canada. Purchase desired.

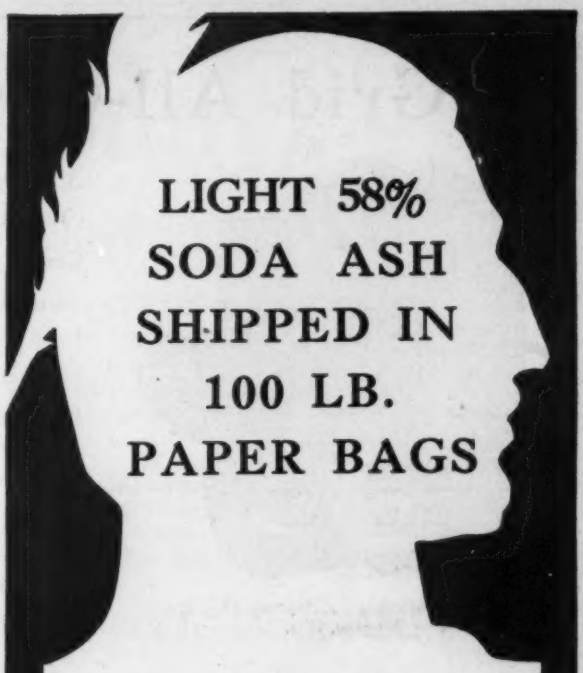
No. 43801—Paper and pulp machinery, especially fine Fourdrinier wires. Montreal, Canada. Agency desired.

New Shipping Point Named Hercules

Hercules, Delaware is the name of the latest shipping point to be added to the roster of freight forwarding and receiving stations in northern Delaware. The new station is on the Landenburg branch of the B. & O. railroad and is marked by a special side track to the new experimental station being constructed by the Hercules Powder Company of Wilmington. Hercules, Delaware is about five miles from Wilmington and is a freight station only.

Roadwork on the spacious grounds of the new experimental station site is practically completed and excavation is now starting for the foundation work of the new main laboratory building. A number of other buildings, including several semi-plant units, will be erected prior to the removal here of most of the company's research facilities from Kenvil, N. J.

M. F. Corin, who for fourteen years has been Philadelphia district sales manager for The Permutit Company, New York City, has been appointed general sales manager. Mr. Corin will be located at the main office in New York, and will have supervision over 19 branch sales offices in the United States, as well as sales agencies in foreign countries.



LIGHT 58% SODA ASH SHIPPED IN 100 LB. PAPER BAGS

WYANDOTTE Soda Ash is now packed in multi-wall paper bags. Five layers of special paper end the old dust nuisance—no meshes to let the dust seep through. The smooth paper lining lets the entire contents slide right out.

The new size makes handling easier, quicker, less expensive. You save time, labor. Guaranteed dust-proof, leak-proof, break-proof, moisture-proof.

Michigan Alkali Company is the first Soda Ash manufacturer to successfully use this method of packing Soda Ash.

"Distinguished for its high test and uniform quality"

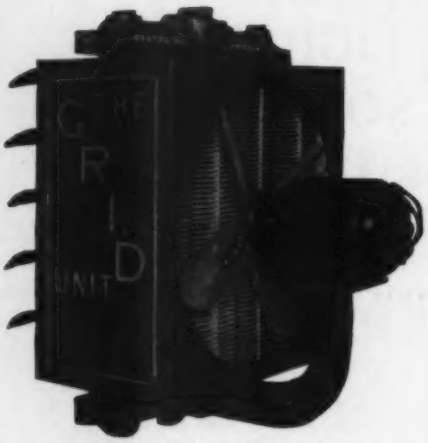
MICHIGAN ALKALI CO.

General Sales Department

21 East 40th St., New York City

CHICAGO OFFICE: 1316 SOUTH CANAL ST.
WORKS: WYANDOTTE, MICHIGAN

Grid All-Cast Radiation



A Product of the D. J. Murray Mfg. Co.
Wausau, Wis.

A new principle in Unit Heater design.

Great strength in all its features combined with light weight.

Compact — Efficient — Non-corrosive.

Suitable for high or low pressures.

Equally applicable to heating or cooling problems.

Designed for Steam — Water — Brine — Ammonia.

Used not only for Unit Heaters and Coolers, but also for

Blast Radiation
Direct Radiation
Concealed Radiation

Built in a variety of sizes.

Fully tested and guaranteed.

The Unit Heater & Cooler Company

Home Office and Plant
Wausau, Wisconsin

First National Bank Bldg.
Chicago, Illinois

Salmon Tower Bldg.
New York, N. Y.

BUILT FOR HARD WORK, LONG LIFE, AND NO WORRY TO THE OWNER

ZAREMBA
EVAPORATORS

HAVE ESTABLISHED AN ENVIABLE REPUTATION

IN THE CONCENTRATION OF

SODA BLACK LIQUOR SULPHATE BLACK LIQUOR
SULPHITE WASTE LIQUOR

DUE TO
WIDE EXPERIENCE—THOROUGH ENGINEERING—PAINSTAKING CONSTRUCTION

ZAREMBA COMPANY
506 Crosby Bldg., Buffalo, N. Y.

New York City Office: 95 Liberty St.

Merco Nordstrom Chooses Slogan

Indicating the intense interest aroused by the recent slogan contest held by the Merco Nordstrom Valve Company, San Francisco, 11,275 slogans were received by the manufacturers over a period of approximately sixty days according to H. S. Shuey, secretary.

The Merco Nordstrom Valve Company offered $500.00 in prizes for the best slogans pertaining to Nordstrom valves and contributions were received from every state in the Union and several hundred from foreign countries.

The majority of slogans were sent in by employees and officials of industrial concerns.

The jury of awards exercised great care in checking over the mass of slogans and each was read by the jury and given consideration. From more than 11,000, 19 were finally selected for the prizes. The Grand award was given to J. L. Pillow, of the Standard Oil Company, Baton Rouge, La., who contributed the following slogan: "Nordstrom—The Perfect Application of a Principle."

The second award was made to G. E. Genung, 13326 Terry Ave., Detroit, Mich., the slogan being "Hydraulic Lubrication Insures Effective Manipulation."

The remaining 17 slogans selected in order of their preference were as follows:

Fabricated and Lubricated for Long Life—G. C. Bemis, Jr.

Won't Leak, Won't Stick, Lubrication Does the Trick—T. S. Barlow.

The Valve Controls the Flow, the Screw Controls the Valve—Henry A. Webber.

The Turn of a Screw Pushes Lubricant Through—Hal D. Draper.

Nordstrom's Perfection Is Your Protection—Russell Egbert.

For Those Whose Goal Has Been Control—Arthur Atkins.

Nordstrom's Lubricated Action Is the "Seal" of Satisfaction—S. St. Claire.

Bringing Pressure to Bear on Valve Troubles—Albert S. Eggleton.

Will Stand the Strain on Any Main—Fred J. Maples.

Simple to Lubricate, Easy to Operate—G. W. Martindale.

They Lubricate as They Operate—Edith M. Bell.

Loosened and Tightened by Lubricant—L. D. Nicolson.

Where Nordstroms Go in Troubles Go Out—E. J. Shaunce.

With Every Connection Comes Your Protection—C. G. Schram.

Once Installed Never Stalled—Charles W. Smith.

Made Their Way by the Way They're Made—E. D. Murphey.

Satisfaction at Every Turn—Clair Wilkes.

Butterworth Licensed to Make Meehanite Castings

H. W. Butterworth & Sons Co., Philadelphia, manufacturer of textile finishing machinery, has been granted a license for the making of Meehanite castings, by the Meehanite Metal Corp., Chattanooga, Tenn.

It is planned by Butterworth to make Meehanite metal castings for the trade from an ounce to ten thousand pounds. These castings will be made at the Bethayres, Pa. plant, just outside Philadelphia.

Some features of Meehanite metal, according to the new licensee are: Its ability to withstand wear, erosion and corrosion; Meehanite takes an extremely high polish and can be hardened to 600 Brinnell; It can be made with a tensile strength up to 70,000 pounds per square inch.

Despite all of these features, it machines as readily as ordinary grey iron castings, although it is said to be many times as tough as cast iron and much harder.

Cutler-Hammer Personnel Changes

M. C. Steffen has been transferred from the St. Louis office of Cutler-Hammer, Inc., to be manager of the company's office at Cincinnati. Mr. Steffen takes the place of R. I. Maujer, who has resigned.

This company has also appointed Frank J. Burd who has been in charge of its steel mill division at Chicago, to succeed T. E. Beddoe as manager of its Philadelphia office.

Starch—

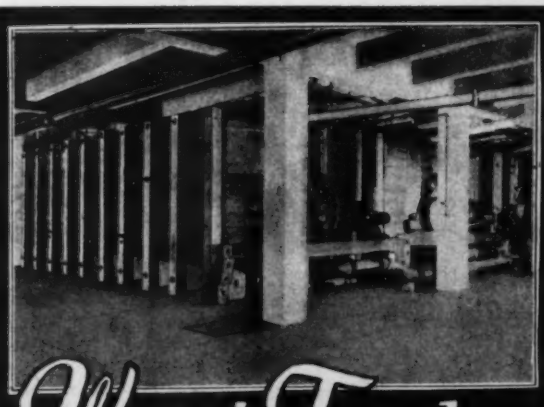
A SIMPLE change in the manufacturing process often results in a pronounced decrease in cost of production.

Paper Mills use Starch for sizing to produce better and stronger sheets with lower cost of manufacture.

Our SPECIAL PAPER brand, furnished in either Pearl or Powdered form for beater-sizing, increases strength of sheet and gives improved finish.

Our FOX HEAD brand for top-sizing is more economical than all glue-size.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York City



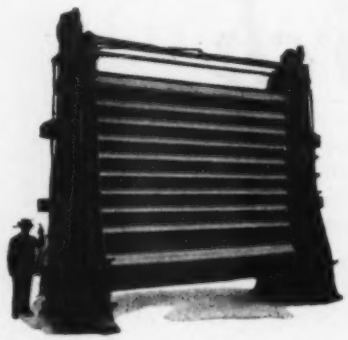
Wood Tanks

are not Corrodable

Half-Round Stuff Chests made of 3-inch Genuine Red Gulf Cypress with heavy yellow Pine bracing. Built and erected in the Frank Smith Paper Mill at Middletown, Ohio.

The Hauser-Stander Tank Company
Cincinnati Ohio

Wood tanks for every purpose in the paper mill, accurately made and only the best material and workmanship are used in their construction.



178" Stack with Hydraulic Lift

FARREL CALENDERS are equipped with Electric Hydraulic or Ratchet Lift, all operated from the floor.

FARREL ROLLS are made in all sizes up to and including 298" on the face.

FARREL products are known all over the world.

FARREL

Farrel Indicating Roll Caliper

FARREL INDICATING ROLL CALIPER is a precision instrument, of very light weight, with which rolls can be calipered to the end of the face without reversing the instrument. Moves freely along the face of the roll, showing the slightest variation in diameter at any point.

FARREL NEW TYPE ROLL GRINDER is electrically driven throughout and is made in *various sizes.*

FARREL-BIRMINGHAM COMPANY INC.

ANSONIA, CONN.

Successor to: { Farrel Foundry & Machine Co., Ansonia, Conn., Est. 1848.
Birmingham Iron Foundry, Derby, Conn., Est. 1836.

ERIE CITY IRON WORKS

ERIE, PENNA., U.S.A.

SALES OFFICES

Baltimore, Md., 501 Hearst Tower Bldg.
Birmingham, Ala., 1425 Tenth Place, So.
Boston, Mass., Rooms 501-502, 25 Huntington Ave.
Buffalo, N.Y., 1073 Ellicott Square
Chicago, Ill., 122 South Michigan Ave.
Cincinnati, Ohio, Brotherhood Building
Clarksburg, W.Va., Osborne Machine Co., Inc.
Cleveland, Ohio, 956 Leader Building
Denver, Colorado, 518-519 Boston Building
Houston, Texas, H. A. Paine Co.
Indianapolis, Ind., 909 Roosevelt Bldg.
Kansas City, Mo., 418-419 West 5th St.
New Orleans, Louisiana, 410 Camp St.
New York City, Benenson Bldg.
Norfolk, Va., Commercial Pl. and Water St.
Oklahoma City, Okla., Liberty Bank Bldg.
Orlando, Florida, Station A
Philadelphia, Pa., 908 City Centre Bldg.
Pittsburgh, Pa., Columbia Bldg.
Portland, Oregon, 224 Pine Street
Salt Lake City, Utah, Atlas Block
San Francisco, Calif., 532 Natoma St.
St. Louis, Mo., 1222 Syndicate Trust Bldg.
St. Paul, Minn., Endicott Bldg.
Youngstown, Ohio, 414 Mahoning Bank Bldg.
Toronto, Ontario, 14 Strachan Ave.
New York City, 25 Broad St., Am. Trading Co. (Export)
Manila, Phillipine Islands, Manila Mach. & Supply Co.
Recife, Pernambuco, Brazil, S.A., Ayres & Son

Write for any of these Bulletins

SB-1 —Unitype Pulverizer
SB-2 —3 Drum Water Tube Boiler
SB-4 —Economic Boiler (Semi-Portable)
SB-5 —H. R. T. Boiler
SB-6 —H. R. T.—Pulverized Coal Fired
SB-7 —Seymour-Carbofrax Water Cooled Furnace
SB-8 —Erie City Shaking Grate
SB-12—Steel Welded Heating Boiler
SB-13—Cross Drum Boiler
No. 200—Vertical Water Tube Boiler
No. 100-A—Horizontal Water Tube Boiler

LET US DEMONSTRATE

What painstaking care and close supervision in the making of a **FOURDRINIER WIRE** can mean to you.

QUALITY MATERIAL, PROPER ANNEAL, UNIFORM TEMPER, UNIFORM MESH, HIGHLY SKILLED WORKMANSHIP, assisted by **EFFICIENT EQUIPMENT.**

This means **LONGER LIFE** and **MORE TONNAGE FOR YOUR DOLLAR.**

WISCONSIN WIRE WORKS

APPLETON - WISCONSIN

Index to Advertisers' Products, Classified

Adhesives
Corn Products Refin'g Co.
E. F. Russ Co.
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E. R. Barker
Acid Resisting Brick
General Refractories Co.
Acid Resisting Bronze
Eastwood Wire Corp.
William A. Hardy & Sons.
Agitator Equipment
The Biggs Boiler Wks. Co.
Manitowoc Engr. Wks.
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Moore & White Co.
New England Tank & Tower Co.
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Timken Roller Bear. Co.
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Timken Roller Bear. Co.
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Norwood Engr. Co.
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Trimbey Mach. Wks.
Consulting Engineers
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Ferguson Engineers.
George P. Hardy
Johnson & Wierk
V. D. Simons.
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Ferguson Engineers.
V. D. Simons.
Johnson & Wierk
Conveyors
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The Jeffrey Mfg. Co.
Link-Belt Company.
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Goodyear Tire & Rub. Co.
The Jeffrey Mfg. Co.
Link-Belt Company.
Conveyor Pipe
Naylor Pipe Co.
Corduroy Wire Cloth
The W. S. Tyler Co.
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B. F. Perkins & Son, Inc.
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The Falk Corp.
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Link-Belt Company.
The Medart Co.
Mid-West Machine Co.
Terry Steam Turbine Co.
T. B. Wood Sons Co.
Cranes (Crawling Tractor)
Link-Belt Company.
Cranes (Dipper Arm)
Link-Belt Company.
Cranes (Electric)
Chisholm - Moore Hoist Corp.
Link-Belt Company.
Maris Brothers, Inc.
Reeper Crane & Hoist Works, Inc.
Swenson Evaporator Co.
Cranes (Hand Power)
Chisholm - Moore Hoist Corp.
Maris Brothers, Inc.
Reeper Crane & Hoist Works, Inc.
Swenson Evaporator Co.
Cranes (Locomotive)
Link-Belt Company.
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Manitowoc Eng. Wks
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Gibbs-Brower Co.
Hudson-Sharp Mach. Co.
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B. F. Perkins & Son, Inc.
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Bagley & Sewall Co., Inc
Beloit Iron Works.
Black-Clawson Co.
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Holyoke Wire Cloth Co.
Lindsay Wire Weav. Co.
Oliver United Filters Inc.
The W. S. Tyler Co.
Damper Regulators (Automatic)
Brown Instrument Co.
Eastwood Wire Corp.
Dandy Rolls
Appleton Wire Works
Eastwood Wire Corp.
Holyoke Wire Cloth Co
Lindsay Wire Weav. Co.
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Oliver United Filters Inc.
Deckle Straps
Stowe & Woodward Co.
Densometers
Foreign Paper Mills, Inc
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Smith & Winchester Mfg Co.
Diffusers
Manitowoc Eng. Works.
Swenson Evaporator Co.
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The Biggs Boiler Wks. Co.
Erie City Iron Works
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Digester Covers
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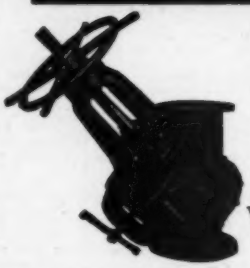

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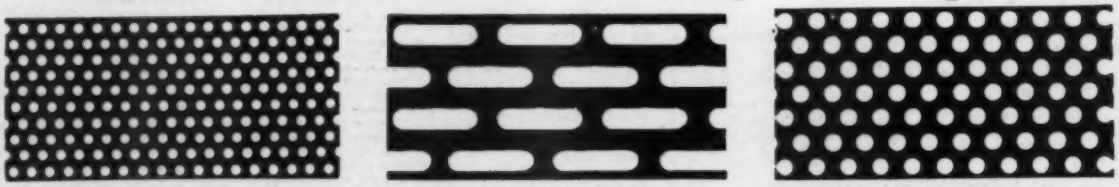

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Gauges (Pressure)
Bailey Meter Co.
The Bristol Co.
Brown Instrument Co.
Taylor Instrument Co.
Gauges (Sulphite)
Consolidated Ashcroft Hancock Co., Inc.
Gauges (Thickness)
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B. F. Perkins & Son, Inc.
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General Electric Co.
Gears (Herringbone)
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Gears (Worm)
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Westinghouse Electric & Mfg. Co.
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J. T. Ryerson & Son, Inc.
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General Electric Co.
Maris Brothers, Inc.
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Holyoke Mach. Co.
Pulp Presses
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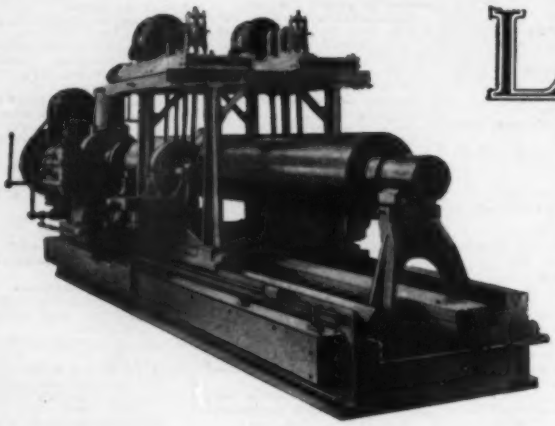

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Pulp Thickeners
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Pulp Washers
Oliver United Filters Inc.
Swenson Evaporator Co.
Pulpwood Stackers
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Erie City Iron Works
Foster Wheeler Corp.
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Lawrence Pump & Engine Co.
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De Laval Steam Turb. Co.
Gibbs-Brower Co.
Lawrence Pump & Engine Co.
Worthington Pump & Mach. Corp.
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Gibbs-Brower Co.
Glens Falls Machine Wks.
Hayton Pump & Blower Co.
Lawrence Mach. & Pump Co.
Lawrence Pump & Engine Co.
The Moore & White Co.
Oliver United Filters Inc.
Smith & Winchester Mfg. Co.
Warren Steam Pump Co.
Worthington Pump & Mach. Corp.
Pumps (Deep Well)
Layne & Bowler, Inc.
Worthington Pump & Mach. Corp.
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Beloit Iron Works.
Buffalo Steam Pump Co.
Downingtown Mfg. Co.
Gibbs-Brower Co.
Glens Falls Mach. Wks
Hayton Pump & Blower Co.
Lawrence Pump & Engine Co.
The Moore & White Co.
Noble & Wood Mach. Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Co.
Pumps, Turbine
Hayton Pump & Blower Co.
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Gibbs-Brower Co.
Nash Eng. Co.
Oliver United Filters Inc.
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Taylor Instrument Co.
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Simonds Worden White Co.
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Brown Instrument Co.
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Bailey Meter Co.
Brown Instrument Co.
Recorders (Specific Gravity)
Bailey Meter Co.
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Foxboro Co., Inc.
Taylor Instrument Co.
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